Impact Assessment Study of Holistic Rural Development Programme (HRDP) Balrampur, Chhattisgarh – P0334

Prepared For:

HDFC BANK | PARIVARTAN
A step towards sustainable progress

HDFC Bank Corporate Social Responsibility (CSR)

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Executive Summary

The study centres on measuring the impact of the Holistic Rural Development Programme (HRDP) of HDFC Bank that was implemented by Udyogini in the Balrampur district of Chhattisgarh from Dec 01, 2020 to March 31, 2023. This study largely focused on understanding the overall process that the HDFC Bank and the implementing organisation undertook in carrying out the programme activities, the key milestones achieved, the impact created by these activities, and the challenges faced. The key focus areas of the intervention were Natural Resource Management (NRM), Skill Training & Livelihood Enhancement (ST&LE), Health and Sanitation (H&S) and Promotion of Education (PoE). The framework used for the impact assessment was an adaptive version of the DAC criteria - Relevance, Effectiveness, and Sustainability. A comprehensive methodology, comprising both qualitative and quantitative primary data collection, was used for the assessment which was carried out in a participatory manner involving all the key stakeholders of the programme. The study included a sample size of 406 beneficiaries as respondents as against the planned sample of 400

Natural Resource Management

In Ramanujganj block, Balarampur district, agriculture is the primary income source for villagers, predominantly relying on rainfed crops and monsoon-dependent irrigation. Socio-economic conditions were dire due to the absence of irrigation systems, preventing farmers from purchasing essential water-supplying resources like pumps and pipes. To address this, Udyogini installed 12 solar irrigation systems with 5 HP pumps, doubling the irrigated area from 60 to 120 acres and benefiting 130 farmers. Additionally, 1,500 saplings of jackfruit, lemon, and guava were distributed to 100 farmers across nine villages, chosen for their environmental and commercial benefits. **Post-intervention, the average gross income increased from INR 68,829 to INR 102,364. Net income also saw significant growth, with the average rising from INR 44,051 to INR 68,050.** The average income grew by INR 23,999, and the median by INR 15,500, reflecting substantial financial improvement. Percentage-wise, the average input cost increased by approximately 33 percent, while the average gross and net incomes grew by 49 percent and 55 percent, respectively. The project's success was attributed to several factors, including improved irrigation access, training, organic manure promotion, Machan farming, orchards, and crop diversification. Vermi pits, creeper farming, and horticulture initiatives also contributed to profit increases for many respondents. The primary crops included paddy, wheat, and maize, with wheat cultivation increasing due to expanded irrigation. **Crop productivity improved significantly post-intervention, with mean paddy productivity rising from 1127 to 1367 kg per acre, wheat from 611 to 749 kg, maize from 732 to 894 kg, and other crops from 779 to 914 kg per acre.** Focused interventions played a crucial role in boosting farmers' incomes, with 90 percent crediting market prices and 87 percent highlighting weather conditions. HDFC's organic farming and advanced farming techniques were also acknowledged for their positive impacts. A 2-sample z-test on paddy productivity confirmed the significant influence of these interventions, reinforcing the project's effectiveness in enhancing agricultural income and productivity.

In collaboration with Village Development Committees, an implementing partner installed ten solar street lights in each of fifteen villages to enhance safety and mobility, especially at night. This initiative, funded by HDFC Bank, saw 58 percent of households accessing the clean energy solution. Currently, 85 percent of the lights are operational, significantly improving safety from nocturnal wildlife and promoting gender empowerment, with 100 percent of respondents highlighting enhanced safety for women and 99 percent noting increased freedom of movement. Despite the positive impact, challenges in maintenance due to spare part procurement and technician access remain, necessitating prioritisation of maintenance to sustain these benefits.

Skill Training and Livelihood Enhancement

Under the ST&LE, HDFC Bank had launched various initiatives to enhance access to agricultural training and services in the project villages. These initiatives include vermicompost production, Jeeva Amrit, Machan system, crop diversification, and lac cultivation. Selected farmers from four villages received vermicompost pits and worms, and training on manure production, improving crop yields and reducing chemical fertiliser reliance. Additionally, 25 farmers were trained in organic farming techniques, showing similar crop yields to chemical fertilisers but with better soil health sustainability. Lac cultivation was introduced, but high costs and transportation risks of procuring brood lac led to challenges and demotivation among farmers. Machan farming was implemented for 150 farmers, improving nutrition and income. There was a notable increase in the adoption of sustainable practices, such as vermicompost pits and conservation agriculture. **The benefits reported by respondents included increased productivity 82 percent, higher income 66 percent, improved soil health 38 percent, and reduced crop loss 37 percent. HDFC Bank also empowered women through forming and training 21 Women Empowerment Groups (WEGs).** Six WEGs started enterprises, like mustard oil extractor and mini rice mill, generating additional income. Challenges like electric connection issues and high transportation costs affected some projects. Nonetheless, women's financial independence, self-confidence, and community respect significantly increased, though traditional gender dynamics persisted.

Livestock management initiatives included backyard poultry farming and goat rearing. Udyogini trained villagers, provided materials for shelters, and facilitated market access, resulting in increased income and production for both poultry and goat farming. **Goat farming showed a higher income increase reported by 96 percent respondents, while poultry farming improved product quality and market access.** However, health and mortality rates remained challenging for both sectors. Vaccination camps and livestock management training were widely used services. Average income from livestock increased by 62 percent, from INR 566 to INR 919, reflecting the positive impact of the interventions. These initiatives led to increased productivity, income, and sustainability; challenges in maintenance, pest management, and gender dynamics need ongoing attention. Tailored approaches are essential to address specific needs and enhance the effectiveness of agricultural and livestock management practices. These interventions have empowered rural women, and improved economic opportunities, though continuous support and adjustments are necessary to sustain and build on these gains.

Health and Sanitation

Under H&S, HDFC Bank and Udyogini have significantly improved community access to safe drinking water and agricultural practices. Before the intervention, families relied on distant hand pumps and wells, burdening women with daily water collection. Installing twelve solar drinking water units and forming *Nigrani Samitis* for maintenance drastically reduced this burden, enhancing quality of life. Health indicators improved notably, with 73 percent reporting fewer waterborne diseases and 76 percent experiencing relief from stomach issues. Enhanced water access saved time and reduced physical strain for 93 percent and 88 percent of respondents, respectively. Additionally, to address child stunting, Udyogini and HDFC provided nutrition plant seeds and training to 60 farmers, promoting organic farming and sustainable practices. All beneficiaries received seeds, and 79 percent received training, although only 15 percent had demonstrations. The kitchen gardens reduced food expenditure for 94 percent of respondents, provided additional income for 64 percent, and improved horticulture practices for 70 percent. Despite these successes, awareness of soil fertility benefits was lower, with 24 percent respondents. Overall, the initiatives fostered economic benefits, improved health, and enhanced agricultural productivity, contributing to better living conditions and empowerment in the community.

Promotion of Education

The infrastructure of educational institutions plays a crucial role in enhancing the quality of education. To address this, HDFC Bank initiated various educational projects in Pipraoul and Trikunda villages under its thematic promotion of education program. These projects included the construction or renovation of smart/digital classrooms, school building renovations, and the establishment of libraries. Smart classrooms with LED interactive touch panels revolutionized learning, making it more interactive and engaging. Renovations, such as painting works, improved the school environment, creating a welcoming atmosphere for students. Libraries promoted a reading culture by providing access to a wide range of books. Educational wall paintings and messages (BaLA) made learning more interactive and creative. These efforts resulted in notable improvements. 76 percent of respondents observed better student attendance, 72 percent saw improved concept retention, and 100 percent reported more interesting classes. Additionally, **88 percent noted timely lesson coverage, and 65 percent saw regular attendance and 24 percent observed a decrease in dropout rates.** Overall, HDFC Bank's interventions significantly upgraded educational infrastructure, enhancing student engagement, attendance, and learning outcomes.

Table 1: Summary of Key Income Indicators

Income Indicators (based on median)	Before	After	percent Change
Increase in net income from agriculture (mean value) (INR)	44051	68050	55 percent
Average Productivity of Paddy (Kg/Acre)	1200	1367	14 percent
Average Productivity of Wheat (Kg/Acre)	600	600	-
Average Productivity of Maize (Kg/Acre)	600	800	33 percent
Average Monthly Income from Livestock (INR)	566	919	62 percent

The above table indicates there is a healthy increase of average net income from agriculture and the income from livestock management have shown a significant increase over the project duration.

HRDI Indicators

The table displays the Holistic Rural Development Index (HRDI) for four thematic areas of intervention within the project. Overall, the HRDI has increased by an impressive 112 percent compared to the baseline. Particularly noteworthy is the substantial impact seen in the ST&LE category, with an outstanding 650 percent increase over the baseline, that can be attributed to the impact such as increased productivity 82 percent, increase in income by 66 percent, improved soil health as reported by 38 percent respondents, and subsequent reduction in crop loss as reported by 37 percent. Formation of 21 Women Empowerment Groups (WEGs) and setting up of enterprises such as mustard oil extractor and mini rice mill, generates additional income. Moreover, there have been significant increases over the baseline in the "Health & Sanitation," "Promotion of Education " and "Natural Resource Management" categories, reaching 75 percent, 86 percent, and 56 percent respectively.

Table 2: Summary of HRDI Scores

Domain	NRM		ST&LE		H&S		PoE		Total	
HRDI Score	Baseline	Endline	Baseline	Endline	Baseline	Endline	Baseline	Endline	Baseline	Endline
	0.09	0.14	0.02	0.15	0.08	0.14	0.07	0.13	0.26	0.55
percent Change	56 percent		650 percent		75 percent		86 percent		112 percent	

1 Introduction

India has made significant advancements in rural development, with 65 percent of its population residing in rural areas as of 2021 and 47 percent depending on agriculture for livelihood (PIB Delhi, 2023). Agriculture and related sectors contribute 18.3 percent to the nation's GDP (Ministry of Agriculture and Farmers Welfare, 2023), and the rural ecosystem has seen an average annual growth of 10 percent over the last five years. Despite this progress, challenges such as inadequate irrigation, poor soil health, disguised unemployment, limited skill development opportunities, unreliable healthcare access, low literacy rates, and increasing environmental degradation persist. Urban development has outpaced rural progress over the past two decades, leading to rural-urban migration. Strengthening the rural economy is crucial for India's overall economic development. In response, HDFC Bank's Corporate Social Responsibility (CSR) initiative 'Parivartan' supports various programmes aimed at providing holistic rural development to enhance the growth and prosperity of the rural population.

1.1 About HRDP

Under the aegis of *Parivartan*, the Holistic Rural Development Programme (HRDP) is HDFC Bank's flagship CSR programme in which non-governmental organisations (NGOs) across the country are supported to undertake development interventions in four thematic areas:

a) Natural Resource Management (NRM)
b) Skill Training & Livelihood Enhancement (ST&LE)
c) Health and Sanitation (H&S)
d) Promotion of Education (PoE)

The World Bank defines rural development as the improvement in the social and economic environment of the rural population. The fundamental aims of rural development include planning, creating, and using resources such as land, water, and manpower to promote equal opportunity for the population reliant on them. Given this context, HRDP strives to enhance the lives of people in rural communities by primarily bringing about sustainable socio-economic transformation and ecological development. Its holistic approach caters to their various needs by addressing the development of human capital, effective management of natural resources, economic independence through skilling and livelihood opportunities, basic infrastructure development, and enhancement of living conditions.

1.2 Objectives of Impact Assessment

The impact assessment aims at understanding:

- Overall process undertaken for implementing HRDP activities
- Key milestones achieved
- Impact created by HRDP activities
- Challenges faced and how they were managed

The guiding philosophy behind this assessment is to add value by showcasing successful initiatives and recommending possible ways to address existing challenges.

It seeks to:

- Critically and objectively evaluate implementation and performance

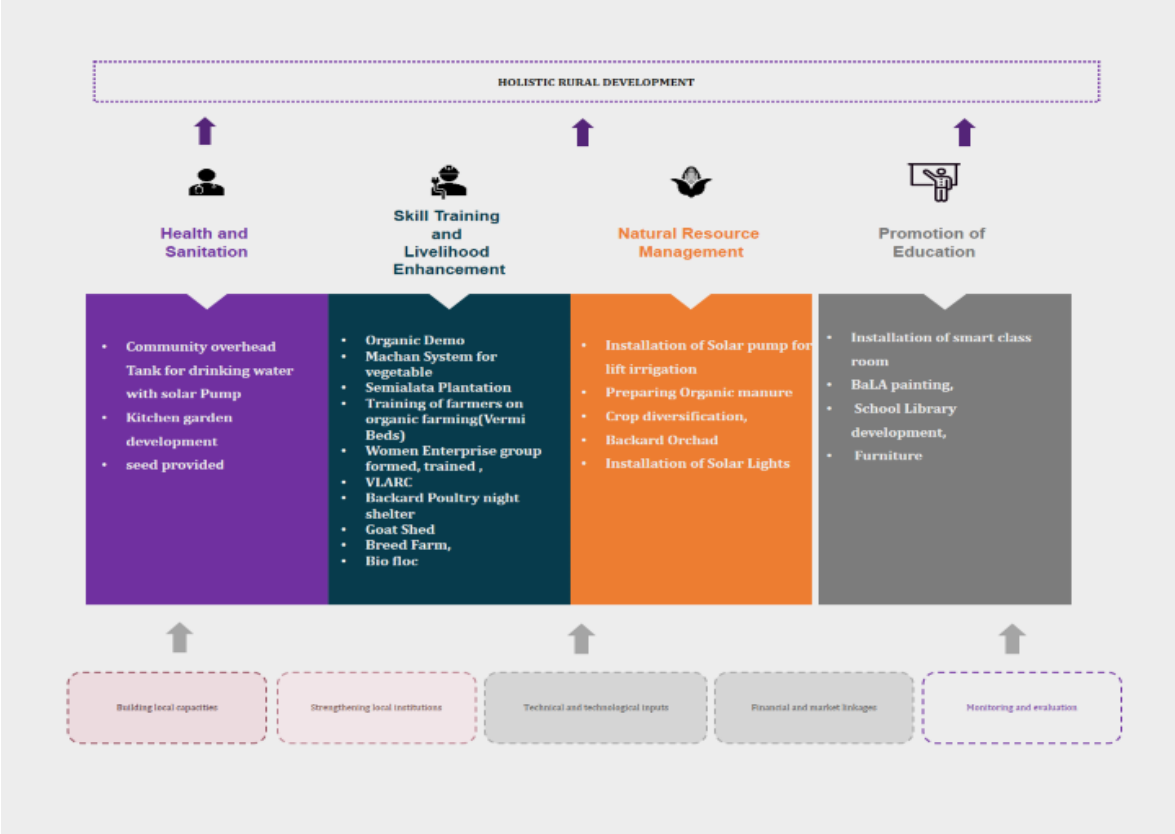
- Determine reasons for certain outcomes or lack thereof
- Derive lessons learned and good practices
- Provide evidence-based findings to inform future operational and strategic decisions while planning and funding partner organisations

This assessment was also an opportunity to assess the on-ground relevance and effectiveness of the project.

1.3 Conceptual Framework Adopted

The conceptual framework and the areas covered under the assessment are depicted below . The aim is to build local capacities and strengthen local institutions, while giving technical input and conducting evaluations across the four thematic areas. The objectives under NRM, ST&LE, H&S and PoE are enumerated in the figure below.

Figure 1: Conceptual framework



1.4 About the Project Area

This assessment offers an extensive and impartial report conducted by a third-party entity, evaluating HDFC Bank's Human Resource Development Program (HRDP) implemented as part of the Parivartan initiative in a disadvantaged region of the Balrampur district of Chhattisgarh. The program, executed by Udyogini, the implementing partner in this district, spanned from 1st Dec 2020 to 31st March 2023 and encompassed interventions in fifteen villages. Its primary objective was to facilitate the sustainable development of marginalised rural communities by enhancing the capabilities of individuals and institutions. The assessment study took place from April 23rd, 2024, to May 4th, 2024.

1.5 About the Implementing Partner

Udyogini means woman entrepreneur; the organization was established in 1992 to implement Women's Enterprise Management Training Outreach Program (WEMTOP), a project of the Economic Development Institute of the World Bank. The project facilitated the Women's Enterprise Management Training to about 20+ NGOs in Odisha, Bihar and Rajasthan. In the past 25 years , the organisation has been dedicated to empowering rural-tribal women by building their entrepreneurship skills. Udyogini has emerged as a leading NGO working to provide customised "business development services" for rural-tribal women in Rajasthan, Madhya Pradesh, Chhattisgarh, Jharkhand and Uttarakhand through working on some selected potential product value chains like lac, poultry, goat and high value agricultural crops. The value chain approach has enabled the organisation to equip women in rural-tribal areas with the requisite skills and knowledge to enhance their income and social status. The youth in urban and rural areas are provided with self-employment and skill-based placements, while other NGOs and government projects have benefitted from the delivery of its business services.

Udyogini is implementing the Holistic Rural Development Program (HRDP) in villages situated at Ramanujganj Block of Balrampur district of Chhattisgarh from 1st December 2020 with the support of HDFC Bank CSR Parivartan. The project thematic area covers all aspects of Natural Resource Management, Skill Training and Livelihood Enhancement, Health and Sanitation and Education to ensure the positive growth and development among the community members.

2 Research Design and Methodology

The impact assessment used a mixed method that includes both qualitative and quantitative methods to assess the impact of the project interventions. The impact assessment process was carried out in a consultative manner, engaging with key stakeholders involved in the project design and implementation such as HDFC Bank and Udyogini.

2.1 Criteria for Assessment

For each thematic area, project activities accomplished by Udyogini were identified from their project documents, reports and MIS that they submitted to HDFC Bank. The impact of those activities was assessed using the following criteria:

- Relevance and Convergence
- Impact and Effectiveness[1]
- Sustainability

Under the criterion of **relevance and convergence**, the team assessed whether the design of the project interventions was:

a) Aligned with the state's plans and priorities for rural development.
b) Relevant to the local needs of the most vulnerable groups.
c) Convergence with (and making use) of the government's existing resources.
d) Enabling different stakeholders to work together to achieve the intended outcomes of the programme.

To assess the **impact and effectiveness** of the project, the team established the values of outcome indicators for all four thematic interventions. The findings were assessed against these values through the identification of qualitative evidence and analysis of project outcomes (in light of variables identified in consultation with HDFC Bank). The team tried to understand whether and how the project impacted the lives of community members in the project areas. The findings from primary quantitative data were substantiated by the information gathered from discussions with the communities and beneficiaries, teachers, students, entrepreneurs, and local village-level institutions.

For the criteria of **sustainability,** the team studied the primary data to understand if the project has worked on strengthening the community's capacity, positioned appropriate institutional mechanisms to ensure sustainability, and if any of the activities or strategies adopted have been or could be replicated.

2.2 Primary and Secondary Data Sources

Primary research included a quantitative household survey that was conducted by the survey team consisting of six enumerators and one supervisor, with backstopping by one field coordinator. The primary quantitative data was collected using the Computer Assisted Personal Interview (CAPI) method , and a mobile application was developed to collect data. The qualitative research included in-depth interviews (IDIs), Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) with project beneficiaries and secondary stakeholders such as the team

[1] While from an evaluation perspective, impact and effectiveness are two different aspects, in the report, these are used interchangeably.

members of Udyogini, the HDFC Bank programme team, local leaders from the project area, etc. IDIs were conducted with the specific individuals who were recipients of the project. The qualitative research was conducted by the research coordinator.

Figure 2: An FGD in progress

Secondary data sources included HDFC's CSR Policy, Programme Log Frame (Logical Framework Analysis), Rapid Rural Appraisal reports, programme implementation timelines, communication, and documentation products, and other relevant reports and literature related to the project.

The outcome mapping and result chain development were undertaken in consultation with the HDFC Bank team. Standardized key outcomes and indicators were identified for each thematic area (NRM, ST&LE, H&S, and PoE). Based on the standardized list of outcomes and outputs, the questionnaire was developed.

2.3 Sample Size and Distribution

From the fifteen villages of Balarampur where the programme was implemented, beneficiaries were selected using purposive random sampling from a list of beneficiaries obtained from Udyogini. Since beneficiary selection was undertaken independently for each thematic area, the selection of more than one beneficiary from a single household was probable. Also, there were instances where a single beneficiary received multiple benefits and support across the four thematic areas. The inclusion of beneficiaries in all thematic areas were ensured. The target sample size across fifteen villages was 400, out of which 406 sample respondents were reached. The thematic area-wise sample covered was as follows (see **Error! Reference source not found.**).

Table 3: Sample distribution across thematic areas (N=422)

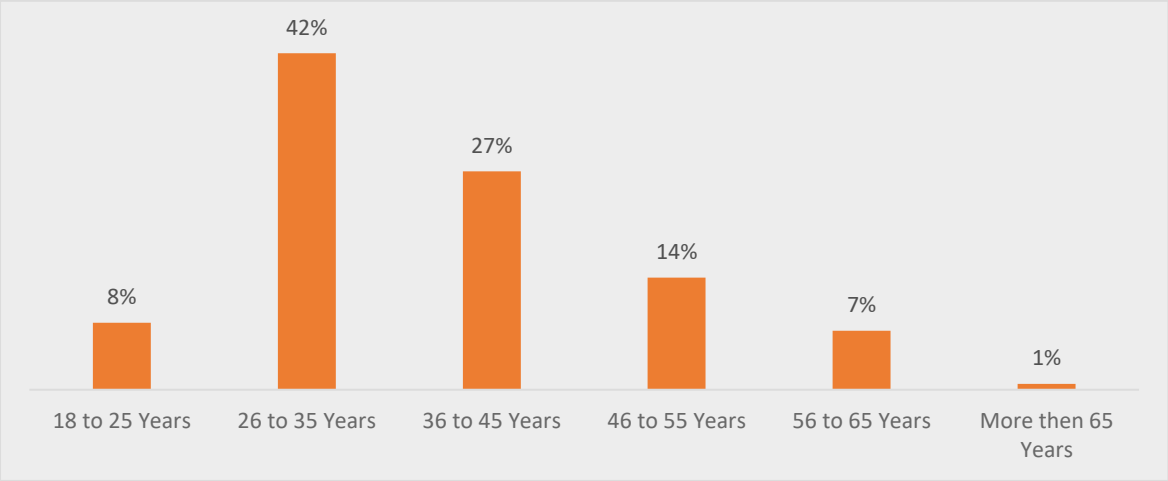
Village Name	NRM	ST&LE	H&S	PoE
Banapati	28	31	0	1
Bhawanipur	13	17	1	5
Bheetiyahi	32	28	5	0
Chandanpur	39	34	8	10
Devgai	43	46	0	0
Deviganj	7	8	1	0

Dhanpuri	20	35	4	0
Lawa	24	31	0	0
Nagra	38	27	5	14
Parhiyadih	19	22	6	0
Pipraoul	27	31	2	22
Purosotampur	33	33	1	0
Teterdih	13	24	0	5
Total	336	367	33	57

Qualitative data collection activities were carried out as a part of the study. These included interviews with various stakeholders such as teachers, students, farmers, livestock owners, beneficiaries of drinking water initiatives, vegetable farmers, *semialata* farmers and breedfarm owners. Additionally, FGDs were organised with different groups, including farmers, Women Enterprise Group (WEGs), vegetable producers' groups, and the general population. KIIs were also conducted with key figures like Sarpanch, those associated with the beneficiaries, and a staff member from the project implementer.

The sample consisted solely of females since all the activities were conducted with female beneficiaries. Similarly, youth (18-55 years) represented the majority of the sample (92 percent) distributed in different age groups. The remaining 8 percent of the respondents were over 55 years of age.

Figure 3: Age Group wise distribution of Sample (N=406)



2.4 Training of Enumerators

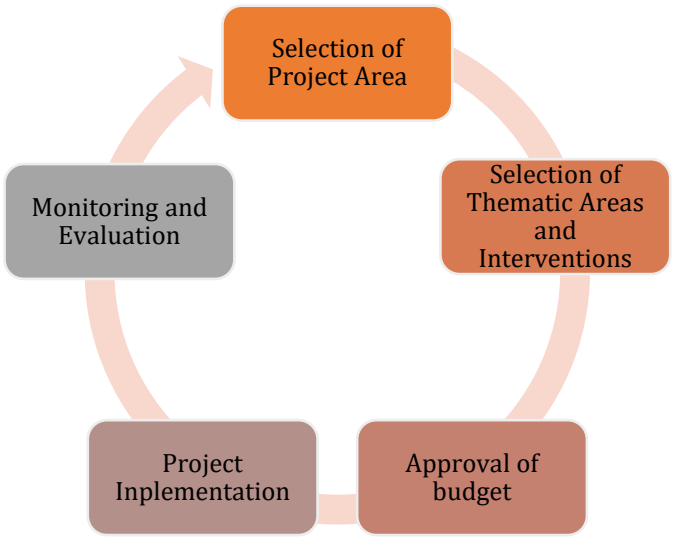
A gender balanced survey team consisting of six local enumerators and one supervisor were recruited with the requisite education and experience for data collection. Two days of training were provided to enumerators and supervisors by the field coordinator and the research coordinator. During the training, the survey team was explained about the project, data collection tools, how to use CAPI, data collection protocols, data quality control, etc. The training included both classroom teaching and mock practice of the survey tool.

Image 1: Training of field team held at Ramanujganj, Chhattisgarh

3 Review of Project Planning and Implementation

The planning and implementation of the project involve five stages: selection of the project area viz., district, block, village etc., selection of thematic areas and interventions; approval of budget; project implementation; and monitoring and evaluation. A review of each of these stages is explained below.

Figure 4: Planning and Implementation Process



3.1 Selection of Project Area

Figure 5: Area covered under the study

Among the 593 districts in India, 187 are designated as tribal districts encompassing 33.6 percent of the nation's total land area. Despite covering a relatively small portion of India's land, these districts account for a substantial 60.04 percent of the country's forest cover. Balrampur is among these tribal districts. The local tribal society is predominantly egalitarian, relying heavily on forests and livestock for economic sustenance, contributing significantly to India's GDP. The proposed project area is located in a remote region characterised by underdeveloped infrastructure and marginalised communities. These communities are engaged in various natural resource-based activities such as forestry, agriculture, livestock farming, and other enterprises. However, they face numerous challenges, including natural resource depletion, low productivity, a lack of technology, and inadequate marketing opportunities, leading to insufficient economic development. The average household income in the area ranges from INR 30,000 to INR 50,000 annually.

Tribal individuals are involved in diverse occupation, including livestock rearing, hunting, fishing, forest product gathering, and rural crafts. However, their livelihoods are adversely affected by a lack of negotiation skills, proper pricing strategies, and secure markets, resulting in lower income generation and an imbalanced livelihood. The project area spans 25 square kilometers and comprises 15 villages in Balrampur district, Chhattisgarh. It primarily targets the Particularly Vulnerable Tribal Groups (PVTGs) of Pahari Korwa, Pando, and Gond, predominantly located in the Ramanujganj block of Balrampur. Over 70 percent of the tribal population in these groups faces challenges related to livelihoods, health, education, and inadequate basic infrastructure facilities.

3.2 Selection of Thematic Areas and Interventions

In response to the challenges faced in the project area, Udyogini proposed interventions funded by HDFC Bank CSR under the HRDP program. The focus was on improving water and farm management, along with promoting clean energy through Natural Resources Management (NRM). Additionally, the project aimed to provide agricultural training, skill development, livestock management, and support for entrepreneurship under ST&LE. Educational institution development and support, as well as health awareness and sanitation practices, were prioritised under PoE and H&S themes, respectively.

The specific activities for each village were determined through thorough consultations with the Village Development Committees (VDCs), established at the onset of the project. Activities under each of the four thematic areas are as follows: (see **Error! Reference source not found.**4).

Table 4: Activities under four thematic areas

Activity Category	Activities	Output Indicators
NRM		
Irrigation Management	Installation of solar pump for lift irrigation	Income from agriculture Farm productivity increases
Farm Management	Preparing organic manure, Crop diversification, Backyard orchard,	
Clean Energy	Installation of solar lights	Clean energy
ST&LE		
Agriculture Training and Support	Organic Demo, Machan System for vegetable, Semialata Plantation,	Access to Agriculture Training and Services
Women Empowerment	Women Enterprise Group formed, trained , Promotion of small and micro enterprises, VLARC	Skill and Entrepreneurship Development
Livestock Management	Goat shed, backyard poultry night shelter, Breed farm, bio-floc	Livestock Management
H&S		
Drinking Water Management	Community overhead tank with solar pump	Clean drinking water
Kitchen Garden	Kitchen garden development, seed provided	Nutritious food
PoE		
Educational Institutions Development	Installation of smart class room, BaLA painting, School library development, furniture	Infrastructure in Educational Institutions

Each category has been further broken down into sub-categories and activities, along with the focus beneficiary types (refer Annexure **Error! Reference source not found.**).

3.3 Project Implementation

The objectives of the project were tailored according to the needs and demands of the study area. The major objectives were:

a) Strengthening or creating irreversible livelihoods for 1500 families

b) Enhancing livelihood opportunities through forest produce, livestock focusing on small ruminants, horticulture, fisheries microenterprises and other allied activities.

c) Strengthening the capacity and capability of women enterprise groups to take up economic activities as entrepreneurs.

d) Increasing the income of the beneficiaries by 30 to 40 percent from different interventions.

Udyogini and HDFC Bank installed 150 solar street lights across all 15 villages, enhancing safety and security during the night and improving access to community services. The use of renewable energy lowered maintenance costs for the community, making it more sustainable. Moreover, solar-powered irrigation units and drinking facilities were set up, easing access to basic necessities for daily activities. The promotion of organic and natural farming practices was emphasised, including activities like vermicomposting and kitchen gardening. Udyogini provided resources such as vermicompost pits and seeds, enabling families to produce nutritious food at home while reducing fertiliser costs.

They employed the "basket approach," which involved producing two or more different products together instead of separately to save costs. This approach was preferred over the traditional method of focusing on economies of scale, which could be risky in rural-tribal areas. Promoting individual products could lead to increased demand, potentially encouraging over-extraction and exploitation of niche products. To avoid the risks associated with promoting single products, Udyogini explored various enterprises on a small scale to understand market opportunities and demand. Different enterprises, such as spice production, oil extraction, rice cultivation, and backyard poultry, were promoted within self-help groups. By expanding the scope of their activities to include multiple products like backyard poultry, goat rearing, and nutritional gardens, beneficiaries could generate year-round income more effectively.

HDFC Bank periodically contacts the relevant implementing partner to ask specific questions about project information.

3.4 Monitoring and Evaluation

The HRDP has a standard monitoring and evaluation approach that was adopted by the implementing partners. These include reporting on project implementation progress periodically to the HDFC Bank. In addition, the program implementation team of Udyogini and HDFC Bank visit the project villages at regular intervals to review the project work sites, participate in the training programs, awareness camps, and interact with project beneficiaries. HDFC Bank periodically contacts the relevant implementing partner to ask specific questions about the project implementation. The project data is primarily managed by the implementing partner in spreadsheets that include details of the village wise activities implemented, beneficiaries mapped against each of the project activities, expenditures, etc. In addition, the implementing partner

submits an annual progress report on the project activities to HDFC Bank along with the plan for the next year. This document serves as the major source of information that provides a summary of the activities implemented, outputs delivered, and outcomes achieved. In addition, the HDFC Bank hired Intellecap as an external agency to conduct an impact assessment of the project after one year of completion. This is an independent assessment that was evaluated using four criteria: relevance and convergence, impact and effectiveness, sustainability, and replicability. This is backed up by the creation of a Holistic Rural Development Index (HRDI) based on selected outcome indicators. The impact of each activity has also been calculated and classified as high, medium, or low impact. The Annexure C goes into greater detail on these.

4 Study Findings

The income sources in the project village, managed by Udyogini, are diversified, most households rely on agriculture as their main source of income, with 89 percent of households involved in agricultural activities. Livestock rearing is also common, with 73 percent of households depending on it for income. However, only a small percentage, around 4 percent, of households have salaried employment, indicating limited opportunities for formal employment in the area. Non-agricultural income sources, such as businesses or rental income, contribute to the livelihoods of 6 percent of households. Wage labour is a significant source of income for 79 percent of households, highlighting the prevalence of informal work arrangements. Additionally, pensions support the income of 5 percent of households. Overall, while agriculture and livestock rearing remain primary sources of income, the community exhibits a diverse range of income sources, with wage labour playing a crucial role in supplementing household earnings.

Figure 6: Distribution of sample based on their occupation (N=406)

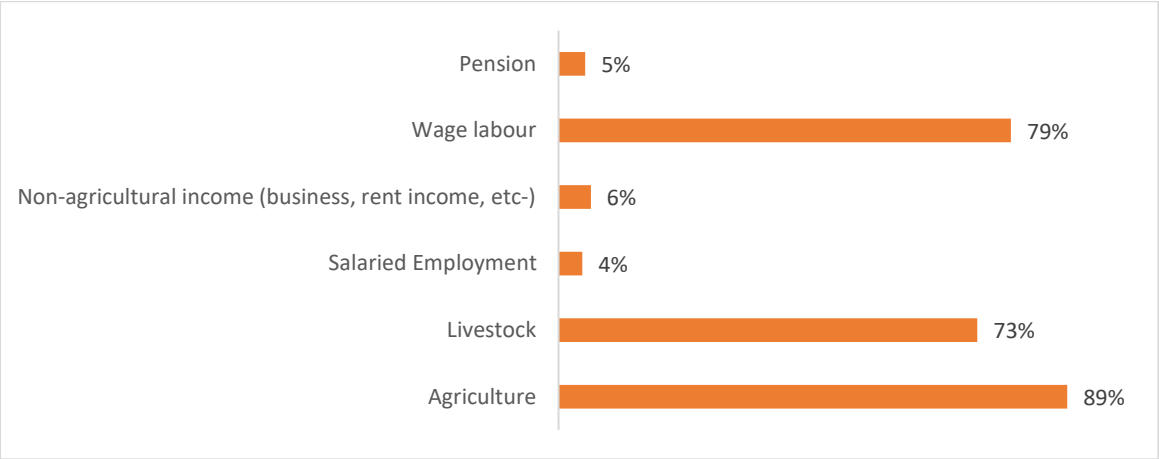


Figure 7: Educational qualification wise distribution of sample (N=406)

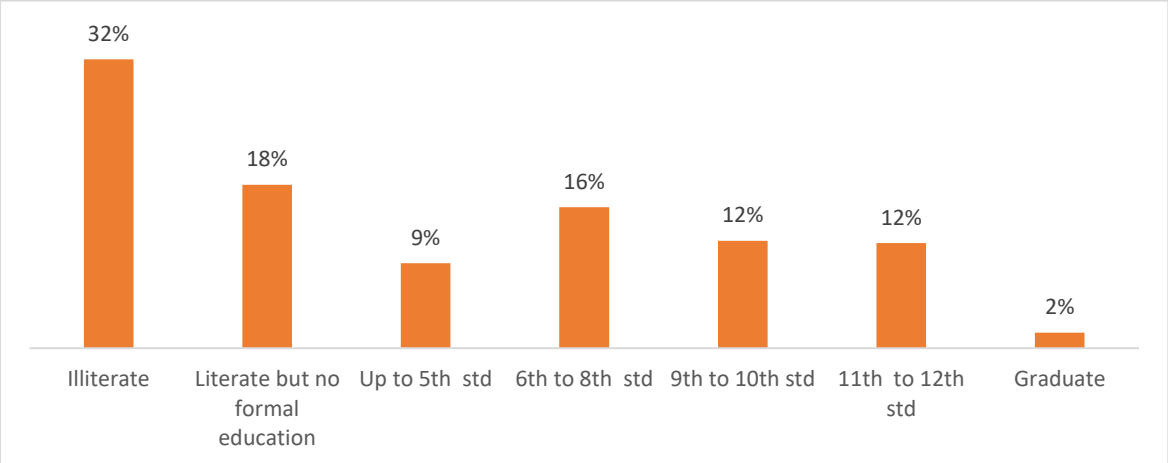
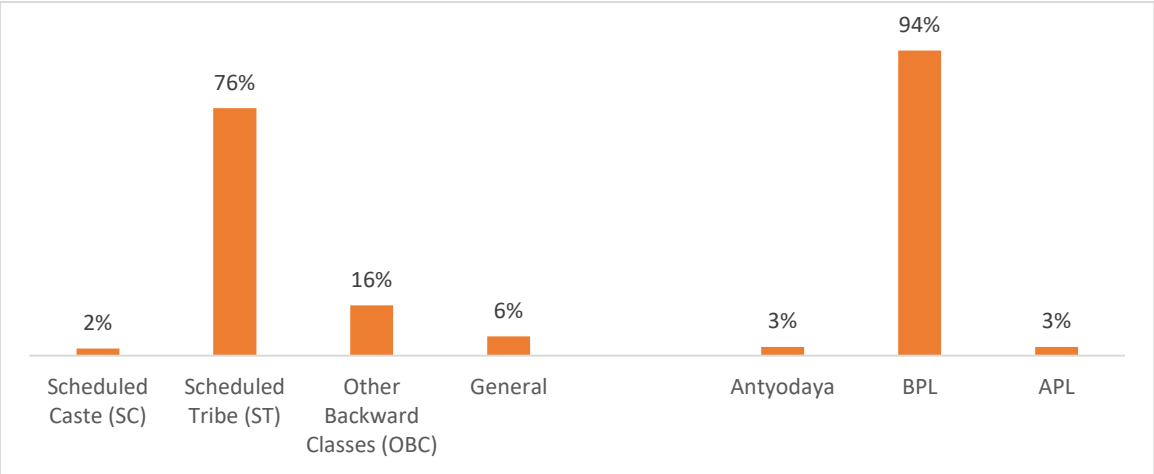


Figure 8: Caste and income categorisation sample (N=406)



In this demographic, Scheduled Tribes (ST) make up the largest proportion at 76 percent, indicating a significant tribal presence. Other Backward Classes (OBC) account for 16 percent of the population, while Scheduled Castes (SC) constitute a mere 2 percent. The General category comprises 6 percent of the population. In terms of economic status, the majority 94 percent fall under the Below Poverty Line (BPL) category, highlighting widespread poverty. Additionally, 3 percent of the population belongs to the Antyodaya category, indicating extreme poverty, while the remaining 3 percent are categorised as Above Poverty Line (APL). Overall, the data underscores the prevalence of poverty, particularly among marginalised communities such as Scheduled Tribes.

While the above analysis represents the nature and status of the sample, the following table represents the summary and quantum of activities carried out under each intervention category of the four thematic areas (see **Error! Reference source not found.**).

Table 5: Quantum of activities under each activity category of four thematic areas

Activity Category	Activities	Nos. (as provided by IA)
NRM		
Irrigation Management	Installation of solar pump for lift irrigation	12
Farm Management	Vermi compost Orchard Hi-tech nursery	50 Nos 100 farmers 1
Clean Energy	Solar lights (street)	150
ST&LE		
Agriculture Training and Services	Organic demo, Machan system for vegetable, *Semialata* plantation, Exposure visit Kisan mela	50 farmers 150 farmers 8 acre and 19 farmers 2 1
Skill and Entrepreneurship Development	Women Enterprise Group formed and trained Promotion of small and micro enterprises, VLARC	21 Nos 05 Nos 05 Nos
Livestock Management	Goat shed, Backyard poultry night shelter, Breed farm,	125 Nos 250 Nos 14 Nos

	Bio floc	1 Nos
H&S		
Health	Celebration of Women's Day	10
Kitchen Garden Devt.	Training given and seed support	50 HH
Drinking Water Mgt.	Community overhead drinking water system with solar pump	12
PoE		
Educational Institutions Development	Installation of smart class room BaLA painting School library development, furniture	2 Schools 8 Schools 2 Schools

(Source: Project MIS from Implementing Agency)

The following sub-sections provide details on the findings in each of the four thematic areas.

4.1 Natural Resource Management

In Ramanujganj block, Balarampur district, agriculture served as the primary income source for villagers, predominantly relying on rainfed crops and monsoon-dependent irrigation. However, farmers' socio-economic conditions were dire due to the absence of irrigation systems, hindering their ability to purchase essential water-supplying resources like pumps and pipes. Recognising this challenge, the Udyogini team installed 12 solar irrigation systems, each with a 5 HP pump, effectively doubling the irrigated area from 60 to 120 acres. This initiative benefited 130 farmers, enabling them to cultivate more crops and boost their income. Additionally, Udyogini identified 100 farmers across nine villages interested in cultivating jackfruit, lemon, and guava. Collaborating with the forest department, they procured and distributed 1,500 saplings of these plants, with each farmer receiving five saplings of each variety. Chosen for their environmental sustainability and commercial viability, these plants could either be consumed by the farmers or sold in the market. Farmers anticipated selling jackfruit and guava for INR 40-50 per kilogram. The farmers planted these saplings in 2021 and are currently awaiting harvest.

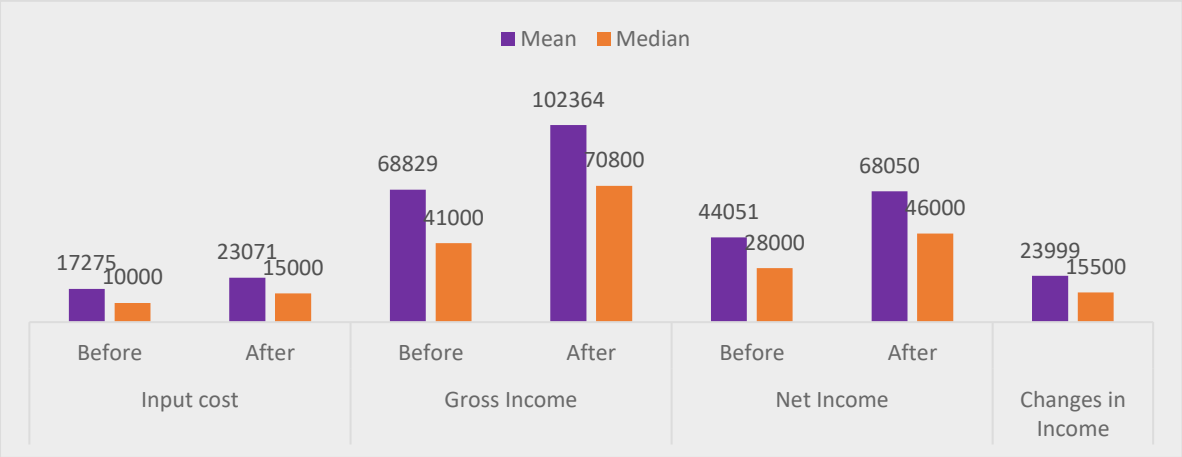
4.1.1 Income from Agriculture

The implemented initiatives have yielded a favorable influence on the farmers' income generation capabilities. Before the intervention, the average input cost was INR 17,275, with a middle value of INR 10,000. After the intervention, these amounts rose to INR 23,071 and INR 15,000, respectively. Similarly, the average gross income before the intervention was INR 68,829, with a middle value of INR 41,000, whereas post-intervention, these figures increased to INR 102,364 and INR 70,800, respectively. Net income also saw an upward trend, with the average rising from INR 44,051 before the intervention to INR 68,050 after, and the middle value rising from INR 28,000 to INR 46,000.

Upon analysing the income changes, there was a significant increase, with a mean increase of INR 23,999 and a median increase of INR 15,500 post-intervention. This reflects a positive impact on the financial situation of the farmers in the area. **Regarding percentage growth, the average input cost saw an approximately 33 percent increase, while the average gross income and net income increased by around 49 percent and 55 percent,** respectively. These results

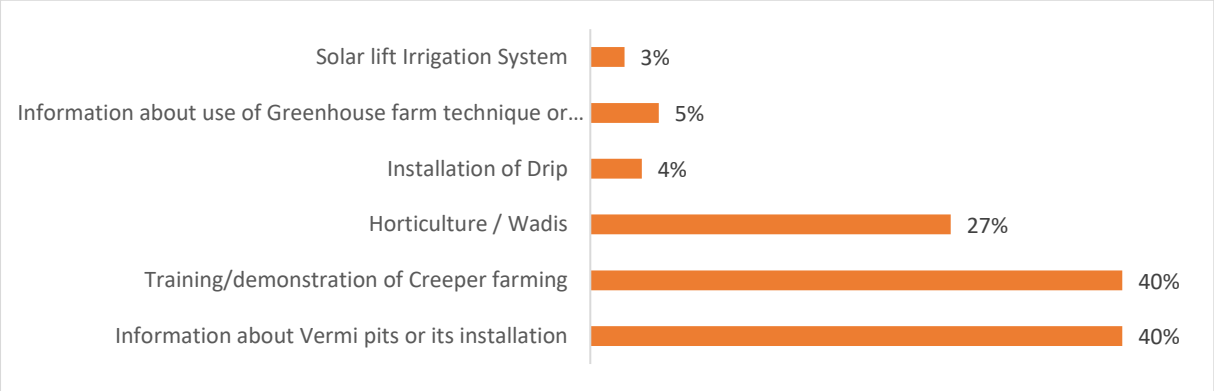
indicate substantial improvements in financial conditions following the intervention, highlighting its effectiveness in bolstering economic stability and livelihoods.

Figure 9: Income from agriculture (N=216)



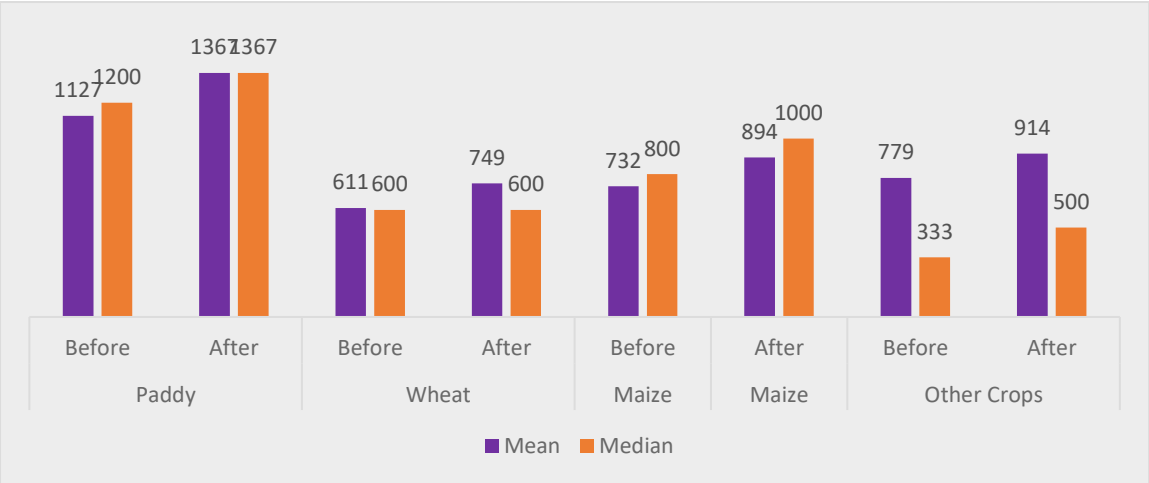
The alteration in farmers' income-generation capacity is attributed to several factors. Foremost among these is the accessibility of irrigation water. Essential elements like training, organic manure promotion, Machan farming, orchards, and diversification of crops have significantly elevated their income and livelihood prospects.

Figure 10: HRDP contribution that contributed to increase in agriculture income (N=216)



The project interventions had various impacts on increasing agricultural profits. For instance, providing information about vermi pits or installing them helped 40 percent of respondents improve their profits. Similarly, training or demonstrating creeper farming techniques also benefited 40 percent of participants. Additionally, initiatives related to horticulture or wadis led to profit increases for 27 percent of respondents. However, interventions such as installing drip irrigation systems, providing information about greenhouse farm techniques, and implementing solar lift irrigation systems had lower impacts, with only 4 percent, 5 percent, and 3 percent of respondents, respectively, reporting profit increases from these measures.

Figure 11:Produtivity per acre (crop-wise)



The principal crops cultivated in the study area include paddy, wheat, and maize. With the expansion of irrigated land, and trainings, farmers have increasingly adopted wheat cultivation as a second crop. As per the quantitative analysis, the productivity per acre of various crops before and after a certain intervention, were represented by the mean and median values. Before the intervention, the mean productivity of paddy was 1127 kg per acre, with a median of 1200 kg per acre. After the intervention, both the mean and median increased to 1367 kg per acre. Similarly, for wheat, maize, and other crops, there were noticeable increases in productivity post-intervention. The mean and median productivity for wheat rose from 611 to 749 kg per acre, for maize from 732 to 894 kg per acre, and for other crops from 779 to 914 kg per acre. These findings suggest that the intervention had a positive impact on crop productivity across the board, leading to significant improvements in agricultural output.

Focused interventions have played a crucial role in bolstering farmers' income in agriculture. A significant percentage, 90 percent, credited the rise in income to market prices, indicating the importance of market dynamics in determining agricultural profitability. Weather conditions were also cited by a large majority (87 percent) underscoring the influence of climatic factors on agricultural outcomes. HDFC interventions in organic farming were mentioned by 41 percent of respondents, highlighting the positive impact of these initiatives on income generation. Additionally, HDFC interventions in farming techniques, such as machan system, orchards, etc., were acknowledged by 14 percent of respondents. A smaller proportion, 5 percent, noted the increase in income due to expansion of the area under cultivation of crops. Overall, the responses reflect the multifaceted nature of factors contributing to income growth in agriculture, encompassing market dynamics, weather conditions, and interventions aimed at enhancing farming practices.

Furthermore, **a 2-sample z-test conducted on paddy productivity yielded compelling results, with a p-value of 0.62 against a z-statistic of 2.68 at a 95 percent confidence level, confirming the significant influence of these interventions.** Detailed calculations can be referenced in Annexure (D), highlighting the efficacy of these strategies in augmenting agricultural income and productivity for farmers.

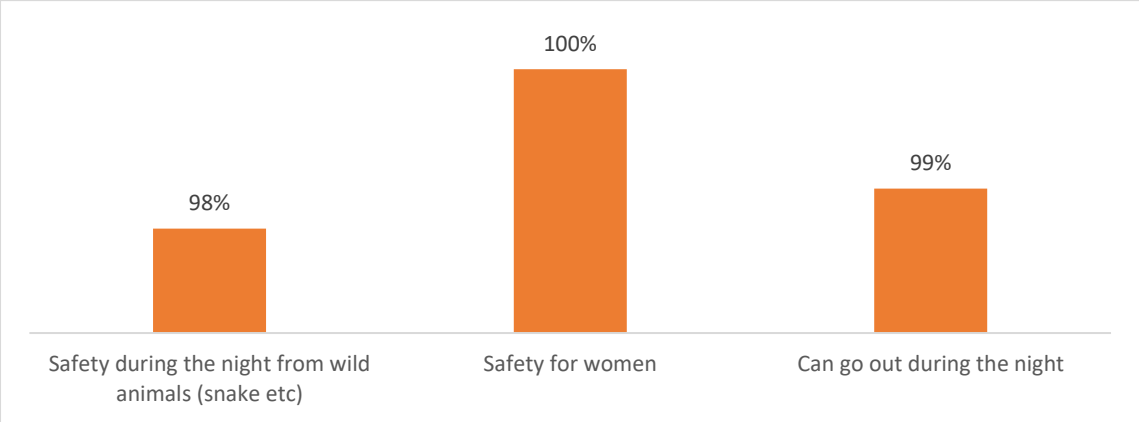
Figure 12: NRM structure run by clean energy (Solar Lift Irrigation)

4.1.2 Use of Clean Energy Solutions

In consultation with the village development committees, the implementing partner installed ten solar street lights in each of the fifteen villages. These installations were strategically placed in areas with common public infrastructure and high foot traffic. The aim was to provide access to clean energy solutions and enhance safety and mobility for villagers, especially during the night.

After the intervention, 58 percent of households reported accessing the clean energy solution provided by HDFC Bank, while the rest lacked access. The introduction of solar street lights notably enhanced their situation, positively affecting the lives of many villagers. Currently, 85 percent of the installed solar street lights are functional, providing continuous illumination throughout the night. This operational efficiency is essential for addressing the safety and mobility requirements of villagers. While villagers assumed responsibility for maintenance, challenges arose due to obstacles in procuring spare parts and accessing technicians.

Figure 13: Benefits of Solar Street Lights (N-305)

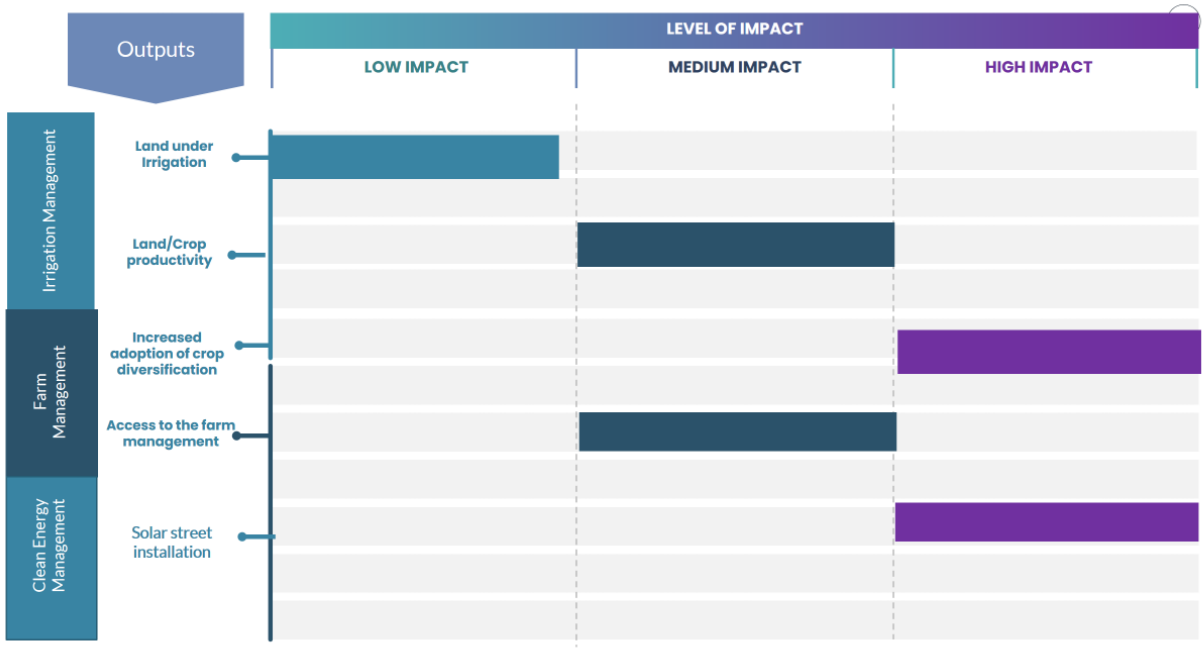


The study yielded overwhelmingly positive feedback regarding the advantages of solar street lights. Specifically, 98 percent of respondents noted feeling safe from nocturnal wildlife, such as snakes, while 100 percent emphasised enhanced safety for women. Furthermore, 99 percent expressed newfound freedom of movement at night, previously constrained by insufficient lighting, thus nurturing social and economic opportunities for villagers. Nonetheless, there remains room for improvement, particularly in ensuring the ongoing functionality of all installed lights. Moving forward, prioritizing maintenance and promptly addressing operational issues are essential steps to sustain the positive impact on the communities.

Figure 14: A solar light installed in the project village

4.1.3 Impact Observations

Figure 15: Level of Impact - NRM



Under the NRM program, access to farm management and crop productivity, has shown a medium impact. Significant progress has been made in the adoption of crop diversification and the installation of solar lights, both of which have shown a high impact. However, the increase in land under irrigation has demonstrated a low impact. Despite this, qualitative studies reveal that, due to the availability of water, farmers are now able to harvest two to three crops per year.

4.1.4 Case Study

A tale of transformation: From despair to prosperity through solar irrigation

In Ramanujganj block, Balarampur district, Chhattisgarh, agriculture is vital for the villagers' livelihoods, heavily reliant on rainfed crops due to the lack of irrigation facilities. The socioeconomic conditions of farmers are dire, with limited access to water resources and electricity for irrigation.

Udyogini and HDFC Bank observed the struggles of farmers in Ramanujganj, who could only cultivate one seasonal crop due to water scarcity. To address this challenge, Udyogini installed solar irrigation panels in Gram Banapati, transforming agricultural practices in the village. The solar irrigation panel, equipped with a 5 HP motor, pipes, and solar panels, serves the needs of 20 farmers in the village. This system irrigates 12-15 acres of land, depending on water availability, enabling farmers to diversify their crops. With reliable water access, farmers now cultivate a variety of vegetables alongside traditional crops like paddy and wheat, enhancing both nutrition and economic opportunities.

The introduction of solar irrigation panels has significantly boosted farmers' income generation. Diversifying crops has not only improved food security but also created surplus produce for sale in local markets. This additional income has bolstered the economic stability of the community, reducing dependency on external sources for livelihoods.

The success of the irrigation system has reignited farmers' interest in agriculture, reducing reliance on forest produce and wage labour. With increased agricultural productivity, the community is experiencing a positive shift towards self-sufficiency and prosperity. This initiative not only empowers farmers but also contributes to the overall development of the community, marking a significant step towards sustainable rural livelihoods.

4.2 Skill Training and Livelihood Enhancement

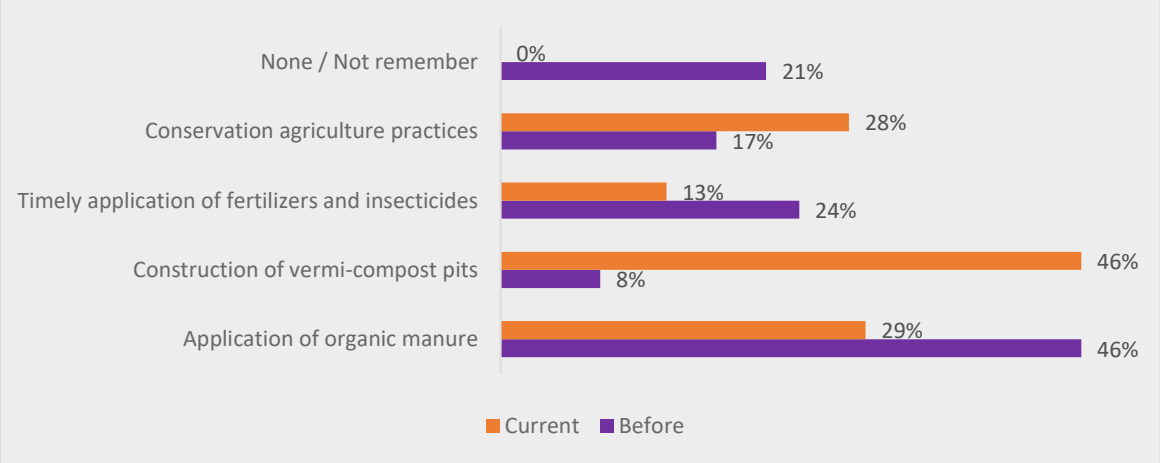
4.2.1 Access to Agriculture Training and Services

Under the HRDP, HDFC Bank has initiated various endeavours to enhance access to agricultural training and services. Some of these include activities like vermicompost, Jeeva Amrit, the Machan system, crop diversification, and training for *semialata* plantations for lac, among others. Selected farmers from four villages who own cattle and engage in vegetable cultivation were provided with vermicompost pits and worms to produce organic manure for their fields. They received guidance from the Business Development Service Provider (BDSP) on how to effectively utilise the pits and manage the manure. The training covered the ingredients for quality manure, ideal temperature conditions, and safety precautions during preparation. This training empowered farmers to produce high-quality manure, leading to improved crop yields and a reduced reliance on chemical fertilisers. Furthermore, they could sell surplus manure to fellow farmers, boosting their income.

In collaboration with the NRLM Department in Ramanujganj, 25 farmers were trained to promote organic farming practices. They learned various techniques, such as preparing *Amrit Pani*, vermicompost pits, *Jeeva Amrit*, and *Panchgavya*. A study was conducted to compare crop production using manure versus chemical fertilisers, revealing similar yields. However, it is crucial to consider the long-term impact on soil health and sustainability, as chemical fertilisers may lead to soil degradation over time.

Nineteen farmers across eight villages embarked on cultivating lac by planting *semialata* trees on their lands. The beneficiaries received *semialata* plants and underwent comprehensive training, demonstrating high enthusiasm for the farming endeavour. Their diligent efforts had led to successful plant growth over the 18-month period, utilising 8 acres of land. However, challenges arose during the subsequent phase of introducing brood lac due to the non-lacquerous nature of the region. Procuring brood lac from distant areas had led to high costs and had posed transportation risks, causing reluctance among farmers and implementing partners to bear the expenses. Consequently, despite initial enthusiasm, the project's objective had remained unfulfilled, leaving farmers demotivated. 150 farmers were equipped with Machan farming, receiving all necessary equipment and seed support for crops like *lauki, tarohi*, french beans, and bitter guard. This initiative not only facilitated access to nutritious food but also enabled farmers to generate income by selling their harvest.

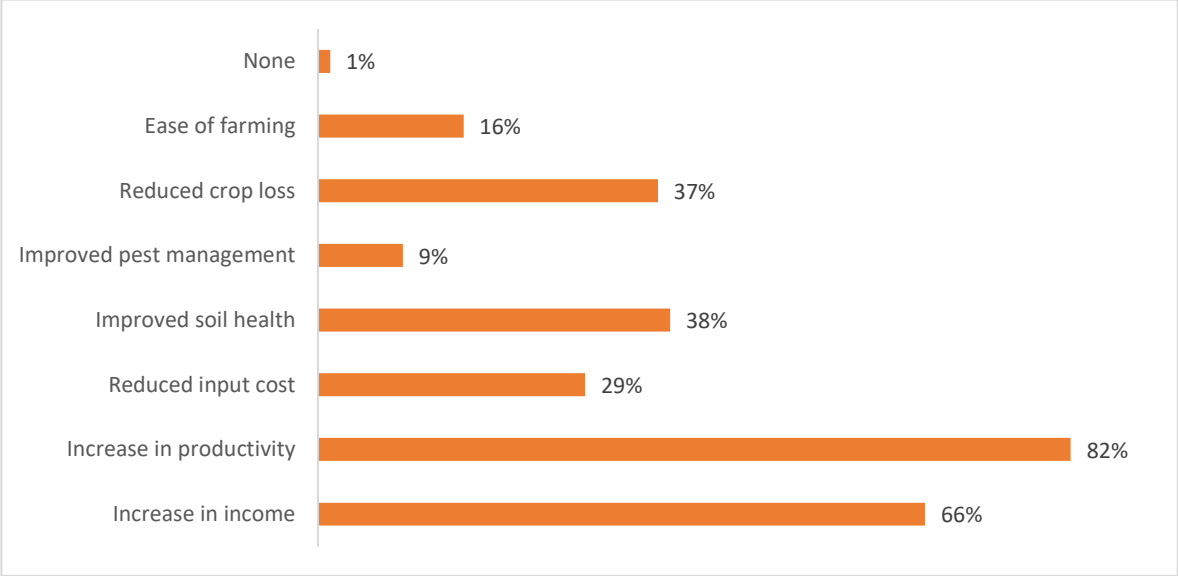
Figure 16: Respondents Practising Different Activities before and after the Interventions (N=76)



The data illustrates a mixed response among respondents regarding the adoption of various agricultural practices before and after interventions. Before interventions, the majority of respondents were engaged in applying organic manure (46 percent) and timely application of fertilisers and insecticides (24 percent), while significant proportions reported not remembering any specific practice (21 percent). However, after interventions, there was a notable shift in adoption rates. The construction of vermi-compost pits witnessed a substantial increase from 8 percent to 46 percent, indicating successful promotion or implementation of this method. Similarly, conservation agriculture practices also saw an increase from 17 percent to 28 percent, suggesting a positive response to interventions aimed at sustainable farming techniques. Conversely, there were no reported changes in adoption rates for practices like Azolla unit, setting up green nets, farm field school, and exposure visits, potentially indicating a need for more targeted promotion or refinement. Notably, the percentage of respondents reporting no practice or not remembering decreased to zero after interventions, highlighting improved awareness or retention of the implemented practices. Overall, while certain practices showed significant

improvement post-intervention, others remained stagnant, indicating the necessity for tailored approaches to effectively promote and implement sustainable agricultural practices within the community.

Figure 17: Perceived improvements due to adoption of agricultural practices (N=76)



The perceived improvements resulting from the adoption of agricultural practices indicate a generally positive impact on various aspects of farming. **The most commonly reported benefit was an increase in productivity, with 82 percent of respondents acknowledging this improvement,** suggesting that the implemented practices have effectively enhanced farm output. Additionally, a significant proportion of respondents (66 percent) reported an increase in income, indicating a direct correlation between the adoption of agricultural practices and economic gains. Moreover, reduction in input costs (29 percent), improved soil health of 38 percent, and reduced crop loss of 37 percent were also recognised, highlighting the multifaceted benefits of sustainable farming techniques. However, the reported improvements in pest management were relatively low (9 percent), suggesting potential challenges or limitations in this aspect of agricultural management. Notably, only a minority of respondents reported ease of farming (16 percent) as a perceived improvement, indicating that while the adopted practices may offer benefits, they may not necessarily translate into reduced labour or effort. Overall, while the data reflects positive outcomes in terms of increased productivity, income, and sustainability, it also underscores the importance of addressing challenges such as pest management and ensuring that interventions lead to tangible ease-of-farming benefits for farmers.

4.2.2 Access to Skill and Entrepreneurship Development

Under HDFC Bank's HRDP, support was extended to empower women's management through bank linkages and enterprise management. As part of this initiative, 21 Women Empowerment Groups (WEGs) were formed, and members were trained. Among these, six WEGs exhibited courage and initiated enterprise activities, such as mustard extractor unit, mini rice mill, *donna pattal* unit, spice and masala making unit, dal processing unit, and bio-floc unit (fisheries). HDFC Bank provided essential machinery, training, and hand-holding support to these ventures. Initially, a mustard extractor unit was allocated to a WEG, but due to the unavailability of the

required electric connection, the unit remained dormant until it was relocated to Devgai village. It is now managed by Maa Saraswati Mahila Swayam Sahayak Samuh, comprising 10 members who received training to operate the machine and manage the business. In March, they generated a revenue of INR 2000 from this enterprise. Similarly, other enterprise activities are also yielding additional income for the members. Although the bio-floc unit introduced a novel concept to the area and received training and support, it struggled to turn a profit in its initial year of operation.

Udyogini and HDFC collaborated to introduce the Village Level Resource Aggregation Center (VLRAC) concept, aimed at empowering rural entrepreneurs across five villages in the Ramanujganj block. These entrepreneurs were selected through the Village Development Committee. The beneficiaries embraced this initiative as an alternative means of livelihood, which included activities like gathering Non-Timber Forest Produce (NTFP) from farmers and selling it in bulk. Through their HRDP Parivartan program, Udyogini and HDFC provided Kiran with necessary resources, such as a weight machine, tarpaulin, counter, carpet, bags, crate, and iron rack, and conducted training sessions. The comprehensive support of the program enabled entrepreneurs to thrive, with Kiran Gupta's journey serving as a remarkable success story.

An initiative to establish a high-tech nursery was undertaken, resulting in the establishment of a nursery in Piparoul, managed by a women's collective known as Pragati Mahila Udyam Samuh, comprising ten members who divided the responsibilities among themselves. Their tasks encompassed sowing, watering, weeding, applying fertiliser, harvesting, and maintaining accounts. Prior to assuming nursery duties, they received training on sowing, pest control, and disease identification. Utilising organic manure provided by Udyogini, they cultivated mango, jamun, drumstick, and papaya plants. Despite dedicated efforts over two years, oversight issues, such as the absence of a soil test and selecting an unfavorable location away from the roadside, impacted the venture. This led to high transportation costs and a fixed rental expense of INR 5000 for the nursery became a burden on them. Despite an initial order of 6000 saplings, the nursery was unable to fulfill a substantial order of 1 lakh saplings due to financial constraints and its disadvantageous location. In light of these challenges and for the education of their children, six members migrated from the area. The remaining members are actively seeking new recruits to complete the team and are exploring the possibility of relocating the nursery to their land to revive the venture.

Figure 18: Perceived benefits of skill development training (N=38)

The interventions have brought about notable changes in the women involved, with a significant majority (66 percent) experiencing enhanced financial independence and economic empowerment. This indicates a positive shift towards greater economic agency and empowerment through their participation in various initiatives. Moreover, all women reported

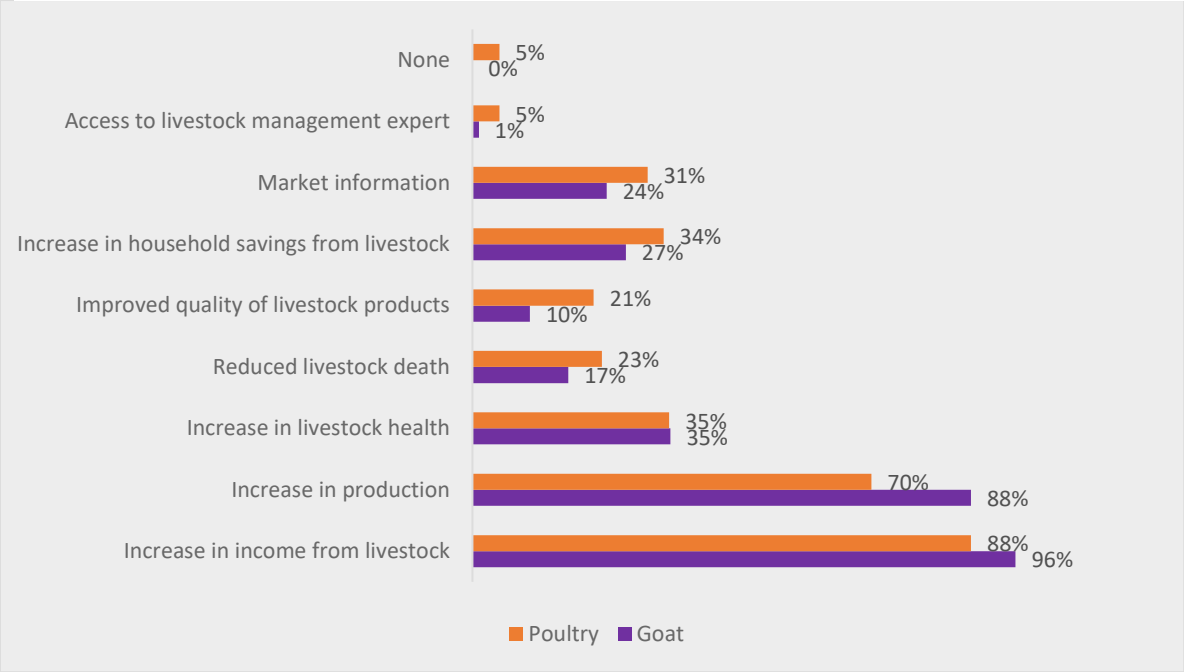
improved self-confidence and leadership skills, reflecting a comprehensive boost in personal development and empowerment. The high percentage (84 percent) indicating increased social recognition and community respect underscores the wider societal impact of the interventions, elevating the status of these women within their communities. However, the data also reveals challenges, as only a minority (26 percent) reported enhanced decision-making roles within the family, indicating that despite advancements in other areas, traditional gender dynamics may still persist in some households. The low percentage (3 percent) reporting better access to education and healthcare highlights potential areas for further improvement in ensuring holistic empowerment and well-being among women and their families. Overall, while the interventions have yielded significant positive outcomes, ongoing efforts are needed to address remaining barriers and promote more comprehensive empowerment across various spheres of women's lives.

4.2.3 Improved Capacity to Generate Income Through Livestock Management:

A comprehensive range of initiatives aimed at improving livestock management were diligently implemented across the project villages. Through a systematic approach, these interventions yielded significant outcomes, as viewed from a researcher's perspective.

Backyard poultry farming involved domesticating birds for egg and meat production, serving as a supplementary source of income for villagers who reared and sold them for a better price. Over two years, Udyogini trained a total of 250 villagers and facilitated the establishment of approximately fourteen breeding farms and 250-night shelters to ensure the sustainability of this enterprise. Each beneficiary received raw materials such as bricks, cement, cement sheets, iron doors, and netting for building the shelters and farms. The objective was to have one breeding farm in each village from which other villagers could purchase chicks at a reasonable price, thereby allowing farmers to make a profit. Additionally, Udyogini trained around 125 beneficiaries in goat rearing as a supplementary income source. In order to establish goat farming as a viable secondary income stream, the organisation provided training in fodder, health, and shelter management to all beneficiaries. Moreover, the organisation supplied materials, including 1,500 bricks, 4 sheets, 8 cement bags, and one door for constructing goat shelters. As a result of these efforts, it was observed that after three years, on average, each person possessed at least one living goat bred for reproduction or sale, and approximately 5-6 goats had been sold.

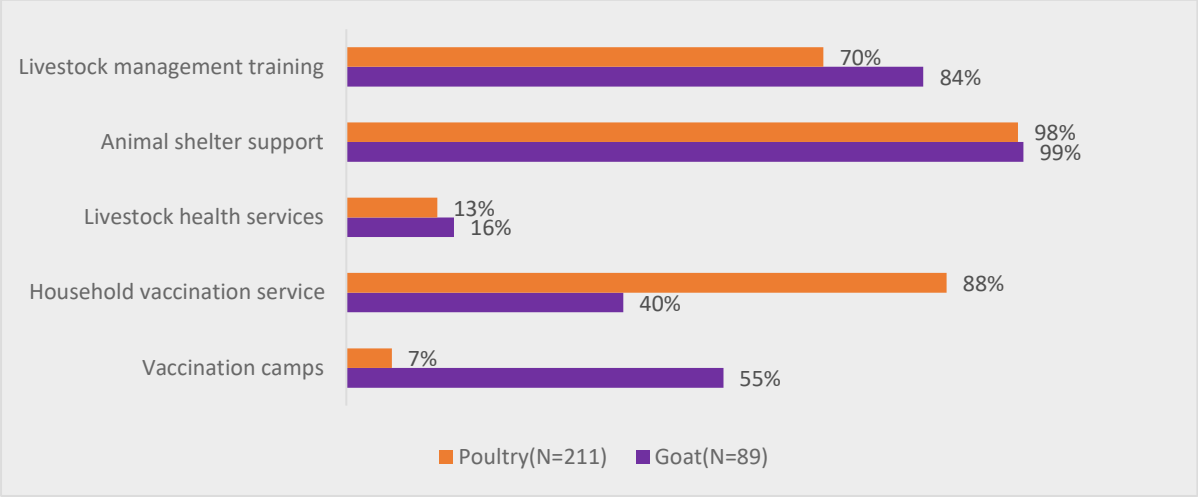
Figure 19: Perceived benefits of livestock management (Goat N=89, Poultry N=211)



The primary benefits gained from livestock management activities vary between goat and poultry farming, as evidenced by the responses of the respondents. For goat farming, the most significant benefit reported is the substantial increase in income, with 96 percent of respondents acknowledging this improvement. This suggests that goat farming is particularly lucrative and has provided a significant source of revenue for farmers. Additionally, goat farming has seen a commendable increase in production, with 88 percent of respondents reporting higher yields. However, challenges persist in terms of livestock health and mortality rates, as only 35 percent of respondents noted improvements in these areas. Furthermore, there is room for enhancement in the quality of goat products, as indicated by the modest 10 percent of respondents reporting improvements. Access to market information and livestock management experts remains limited in the goat farming sector, with only 1 percent of respondents acknowledging this benefit. Conversely, in poultry farming, while the increase in income remains substantial at 88 percent, it is slightly lower compared to goat farming. Production in poultry farming has also seen an increase, though to a lesser extent, at 70 percent. Interestingly, poultry farming has shown a higher level of improvement in the quality of livestock products, with 21 percent of respondents noting this benefit. Access to market information and livestock management experts is relatively better in the poultry farming sector, with 5 percent of respondents acknowledging this advantage. However, similar to goat farming, challenges persist in livestock health and mortality rates, with only 35 percent of respondents reporting improvements in these areas. Overall, while both

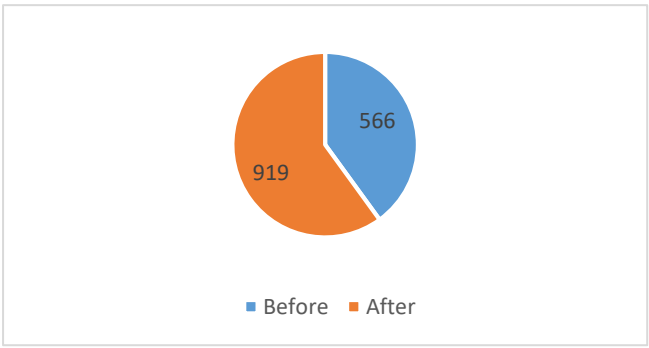
sectors have seen significant benefits, there is a need for targeted interventions to address specific challenges and further enhance the sustainability and profitability of livestock farming activities.

Figure 20: Type of project services received for different livestock (Poultry N=211, Goat N=89)



The survey data reveals a notable disparity in the types of project services received for goat and poultry livestock. For goats, vaccination camps are the most prevalent form of service, with 55 percent of respondents indicating their usage, while household vaccination services closely follow at 40 percent. Livestock management training is highly sought after, with 84 percent of respondents availing themselves of this service, indicating a keen interest in improving husbandry practices and maximising productivity. Animal shelter support is nearly universally utilised, reflecting its critical role in ensuring the well-being and health of animals. However, other services, such as insemination camps and fodder development support, show minimal to no uptake, suggesting potential areas for improvement or reallocation of resources. In contrast, poultry owners predominantly rely on household vaccination services (88 percent) and to a lesser extent on livestock management training (70 percent). While household vaccination services are evidently prioritised, the uptake of other services such as livestock health services and awareness generation campaigns are notably lower. These findings underscore the importance of tailoring project services to the specific needs and preferences of each livestock sector, as well as the necessity of targeted interventions to address gaps in service utilisation and enhance overall livestock welfare and productivity.

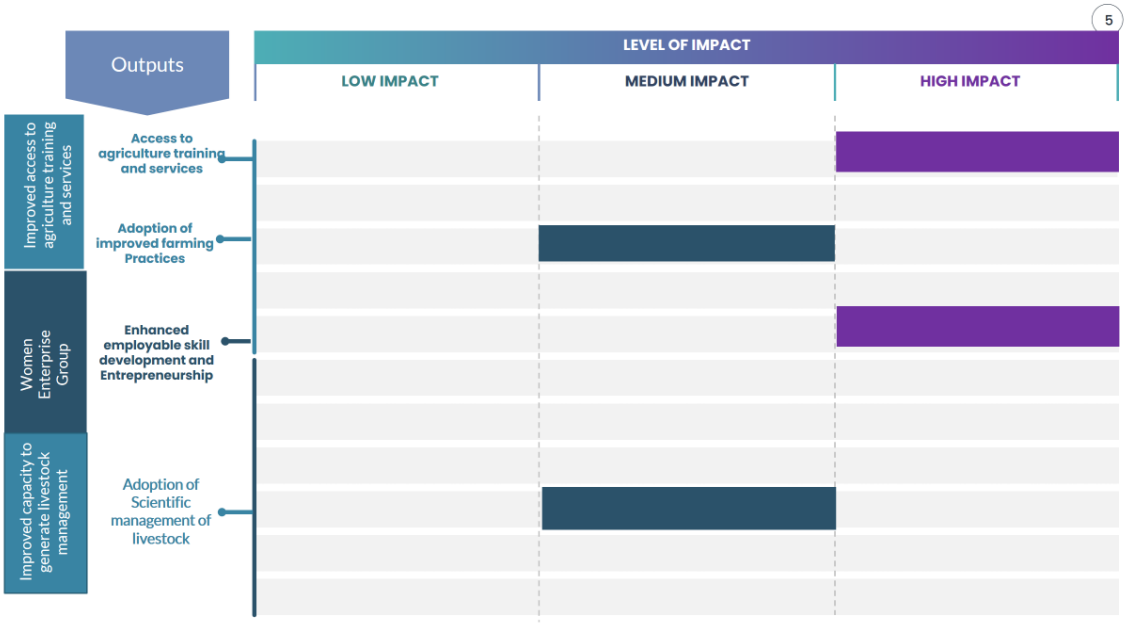
Figure 21: Average monthly income from livestock in INR



The research highlights a substantial rise in the average income derived from livestock before and after a specified timeframe. The data reveals an increase from INR 566 to INR 919, indicating a noteworthy 62 percent improvement. This surge implies a beneficial outcome stemming from interventions or alterations implemented within the livestock sector. These interventions could encompass enhanced management strategies, improved breeding techniques, or better access to markets.

4.2.4 Impact Observation

Figure 22: Level of Impact – ST & LE



4.2.5 Case Study

Empowering livelihoods: Manvarti Singh's journey with goat farming

Manvarti Devi, a marginal farmer from Devgai, faced challenges supporting her family of six due to limited agricultural land. With produce of paddy mainly for consumption, they supplemented their income through wage labour and collecting non-timber products like mahua. Managing a few livestock added to their struggles, hindered by their limited knowledge of proper livestock management.

Recognising Manvarti's situation, HDFC Bank and Udyogini provided support to her family in livestock farming. They proposed building a goat shed, providing essential materials like bricks, asbestos sheets, hooks, cement, and a door. Additionally, they offered training and facilitated collaboration with government departments to ensure access to necessary medicines for the livestock. Her family constructed the goat shed adjacent to their residence with the provided materials and guidance. Initially starting with five goats from relatives, proper care and management led to a significant increase in herd size. Within a year, they sold three goats for INR 12,000 each, earning a total of INR 36,000. Currently, they have 11 goats in their shed, with expectations of further growth in the coming year.

The goat platform not only protects the livestock from diseases but also enhances breeding success and reduces mortality rates. The steady income from goat farming has become a reliable source for the family, providing essential protein and financial stability. Looking ahead, Manvarti Devi seeks assistance from the project team to assess the feasibility of introducing Badawal Bakara in the area. Furthermore, they plan to expand by adding a Machan structure using earnings from goat farming.

Manvarti's journey showcases the transformative impact of targeted interventions in rural livelihoods. Through the support of HDFC Bank and Udyogini, she has transitioned from struggling with limited resources to managing a thriving goat farming enterprise. With continued assistance and innovative planning, Manvarti's family is poised for further growth and prosperity, setting a shining example for sustainable rural development.

4.2.6 Case Study

Empowering rural entrepreneurship: The journey of the bio-floc unit in Deviganj

The introduction of the bio-floc concept in Deviganj, Ramanujganj block, Chhattisgarh, marked a significant shift in the local agricultural landscape. It aimed to diversify livelihood opportunities and promote sustainable aquaculture practices in the region.

Roshini Mahila Udyam Samuh, comprising ten members, was entrusted with the responsibility of managing the bio-floc enterprise. To facilitate their venture, Udyogini assisted in sourcing raw materials, fish, and meals by connecting them with relevant markets. Additionally, an exposure visit to Ambikapur provided valuable insights and motivation for the Women Enterprise Group (WEG) members to operate the unit independently.

Gyanti emerged as a pivotal figure within the WEG, demonstrating proactive leadership and dedication to mastering the intricacies of bio-floc technology. Through continuous training provided by Udyogini, Gyanti acquired the necessary knowledge and skills to monitor and control technical parameters such as TDS, OD, ammonia, and pH levels in the units.

Despite initial enthusiasm, the bio-floc business encountered challenges, including low demand for tilapia fish among locals and high mortality rates. In the first year, sales amounted to only INR 5000, resulting in a loss considering the initial investment of approximately INR 15,000 from the group. Some WEG members withdrew due to a lack of expertise. However, Gyanti and her dedicated team remain resilient, eager to continue with renewed strategies and the inclusion of new members.

Inspired by the bio-floc unit

The bio-floc unit got a lot of people interested, including a retired government worker who decided to start his own bio-floc unit. He invested INR 8 lakhs to make it bigger. He wants to make it even better with the help of the government. This shows that more and more people are interested in sustainable fish farming. By working with the government and meeting what people want, this bigger project can help the area grow. It's a good example of how new ideas can make a big difference in rural areas.

4.2.7 Case Study

Empowering rural entrepreneurship: Kiran Gupta's journey

Kiran Gupta, a 40-year-old resident of Purrussottam Pur village in Balarampur, Chhattisgarh, faced financial struggles due to limited agricultural income from their small plot of land. To support her family, Kiran sold groceries from her home but lacked the resources to establish a proper shop. Despite these challenges, Kiran's entrepreneurial spirit led her to explore alternative avenues, including collecting Non-Timber Forest Produce (NTFP) from farmers and selling it in bulk.

Udyogini and HDFC introduced the Village Level Resource Aggregation Center (VLRAC) concept, aiming to empower rural entrepreneurs like Kiran. Recognising Kiran's central location and prior experience, she was selected to lead the VLRAC initiative in her village. Through their HRDP Parivartan program, Udyogini and HDFC provided Kiran with essential resources such as a weight machine, tarpaulin, counter, carpet, bags, crate, iron rack, and training sessions. Armed with these resources and training, Kiran's credibility soared among the villagers. A signboard displayed outside her house further enhanced trust in her genuineness. With the introduction of digital weighing machines and immediate settlement procedures, Kiran's VLRAC became a trusted platform for NTFP producers, attracting over 50% of the village's produce. Her earnings from the VLRAC initiative increased to approximately one lakh rupees annually. With this newfound financial stability, she invested in expanding her entrepreneurial ventures. She established a grocery shop and ventured into the hospitality sector by opening a small tent house. These endeavours not only diversified her income sources but also contributed to the economic growth of her village.

Kiran's increased income enabled her to provide quality education for her children at a private English medium school. Additionally, she expressed satisfaction in affording good healthcare for her family, ensuring access to quality medicines for her children.

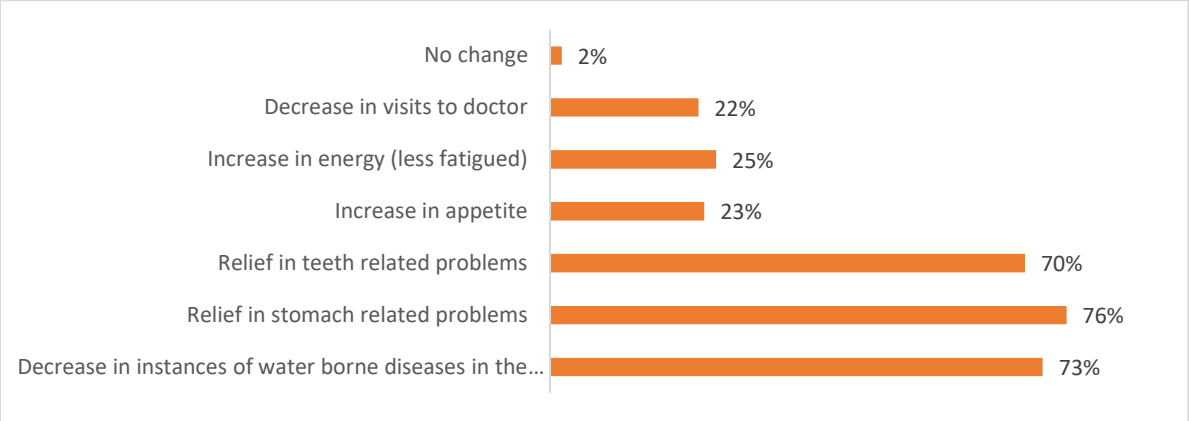
In discussions about future business expansion, Kiran expressed a desire to install a photocopier and include plastic items in her store. Through collaboration with Udyogini and HDFC, Kiran not only improved her family's livelihood but also became a catalyst for change in her village, inspiring others to pursue entrepreneurial endeavours.

4.3 Health and Sanitation

4.3.1 Availability of drinking water

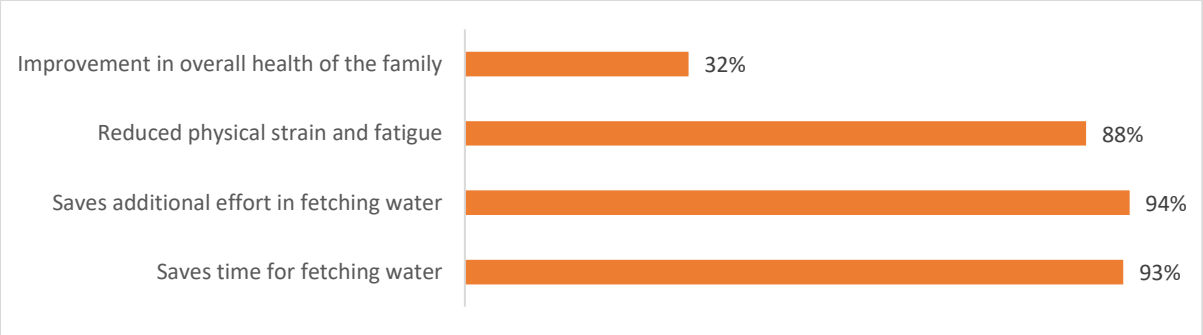
In Ramanujganj block, most families were deprived of safe drinking water before the Udyogini intervention. These families depended on hand pumps and a few wells for household activities and drinking water. Although the distance to the hand pumps varied, on average, each household faced a minimum distance of 100 to 150 meters. This distance, coupled with the sole reliance on these sources, placed a significant burden on the female members of the community. They had to allocate 1 to 2 hours daily to fetch water, leading to work delays and exhaustion. With the support of HDFC, the Udyogini team analysed the situation and installed twelve solar drinking water units in 12 project villages, some equipped with door-to-door water piping. Nigrani Samitis were formed for the maintenance of these units, and they took on the responsibility for upkeep. As a result, the community experienced an improved quality of life, free from the burden of water collection. They could devote more time to their children, household chores, and agricultural activities, and even enjoy some moments of rest. A beneficiary, Noor Jahan says "*Zindagi Khush Haal Ho Gayi.*"

Figure 23: Perceived health benefits of improved drinking water sources (N=114)



The assessment conducted on households benefiting from HDFC Bank's support for drinking water sources and methods reveal a significant improvement in health indicators. The majority of respondents reported positive changes, with 73 percent experiencing a decrease in instances of waterborne diseases such as diarrhoea, cholera, and typhoid. Additionally, 76 percent reported relief from stomach-related problems, while 70 percent reported relief from teeth-related issues. However, the responses indicate lower rates of improvement in other areas, with only 23 percent reporting an increase in appetite and 25 percent experiencing increased energy levels and reduced fatigue. Furthermore, a smaller proportion, 22 percent, reported a decrease in visits to doctors, and only 2 percent of respondents noted no change at all. These findings underscore the significant positive impact of HDFC Bank's interventions on improving the health outcomes of households by providing access to safe drinking water, thereby reducing the prevalence of waterborne diseases and associated health issues.

Figure 24: Drinking water availability helps the women in households (N=114)

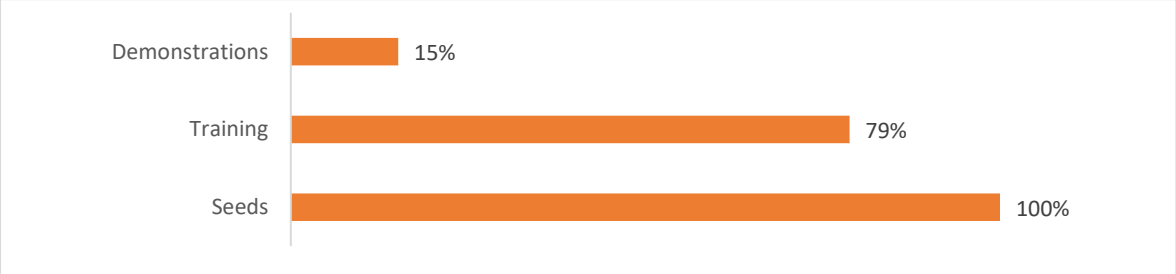


The study on the impact of improved drinking water availability on households, as reported by respondents, highlights several key benefits. Overwhelmingly, 93 percent of respondents noted that the availability of drinking water saved time previously spent fetching water, while 94 percent reported a reduction in additional effort required for this task. Moreover, 88 percent mentioned a decrease in physical strain and fatigue associated with water collection. However, a comparatively lower percentage, 32 percent, cited an improvement in the overall health of the family. These findings underscore the significant positive effects of enhanced water accessibility, particularly in terms of time-saving and reduced physical burden for women, who traditionally bear the responsibility of water collection in many households. While the improvement in overall health may not be as pronounced, the alleviation of physical strain and time savings represent substantial benefits that can contribute to improved well-being and quality of life for households.

4.3.2 Kitchen Garden

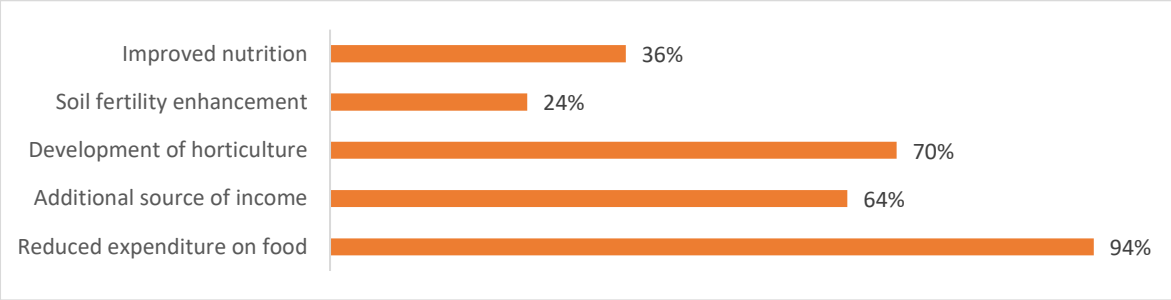
In 2017, Ramanujganj faced high rates of child stunting, ranging from 30-40%, according to an IFPRI report. To tackle this issue, Udyogini and HDFC Bank collaborated to assist beneficiaries by providing them with ten different types of nutrition plant seeds to grow on their land. Sixty farmers with small plots of land were chosen for this project. They received training on how to plant these seeds properly, including methods like line sowing and spacing. The project also encouraged organic farming by teaching farmers how to use vermiculture systems instead of chemical fertilisers, which not only benefit the environment but also reduce costs. Farmers learned how to sell surplus produce for extra income. They were happy to see improvements in their health from using vermicompost and were proud to provide nutritious food to their children. Udyogini also conducted training sessions on sustainable farming practices, like crop rotation and natural pest control, helping farmers reduce their reliance on expensive inputs and increase their crop yields.

Figure 25: Support received from HDFC (N=33)



The responses from beneficiaries show that the majority, 100 percent, received seeds for their kitchen gardens, indicating the widespread distribution of this essential resource. Additionally, a significant portion, 79 percent, received training, suggesting that many beneficiaries were equipped with knowledge on how to cultivate their gardens effectively. However, a smaller percentage, 15 percent, mentioned receiving demonstrations. Demonstrations can be valuable for visually illustrating cropping techniques and best practices. While the provision of seeds and training is crucial for initiating and maintaining kitchen gardens, increasing the emphasis on demonstrations could further enhance beneficiaries' understanding and success in gardening. By offering hands-on guidance, demonstrations can complement the training provided and ensure that beneficiaries have the necessary skills and confidence to cultivate healthy and productive kitchen gardens. Overall, these findings highlight the importance of providing comprehensive support, including seeds, training, and demonstrations, to empower beneficiaries in their kitchen garden endeavours.

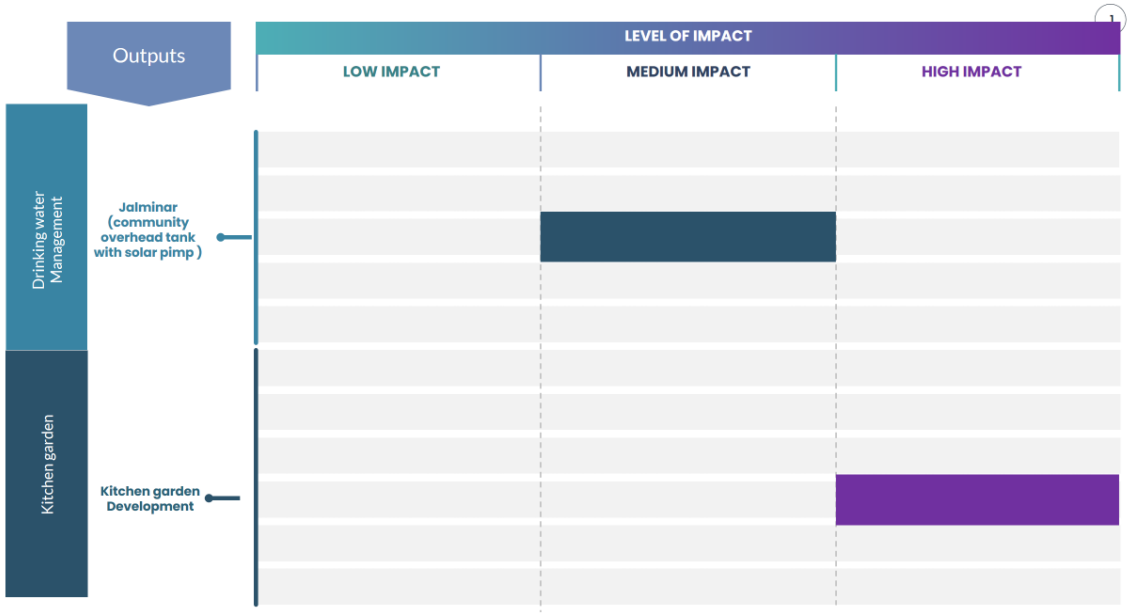
Figure 26: : Perceived benefits of HRDP supported kitchen gardens (N= 33)



The responses from beneficiaries indicate several perceived benefits of the kitchen/nutrition gardens. The vast majority, 94 percent, mentioned reduced expenditure on food as a significant advantage. This suggests that growing their own fruits and vegetables helps save money that would otherwise be spent on purchasing these items. Additionally, 64 percent of respondents cited an additional source of income from their gardens, indicating that they may sell surplus produce for profit. Seventy percent mentioned the development of horticulture, which suggests that the gardens are contributing to the growth and expansion of gardening practices in the community. However, only 24 percent mentioned soil fertility enhancement, indicating that awareness of this benefit may be relatively low among respondents. Similarly, 36 percent mentioned improved nutrition, suggesting that while some recognise the nutritional benefits of home grown produce, there is room for increased awareness and appreciation of this aspect. Overall, these findings highlight the multifaceted advantages of kitchen or nutrition gardens, including economic benefits, horticultural development, and potential improvements in soil fertility and nutrition.

4.3.3 Impact Observation

Figure 27: Level of Impact - H&S



4.4 Promotion of Education

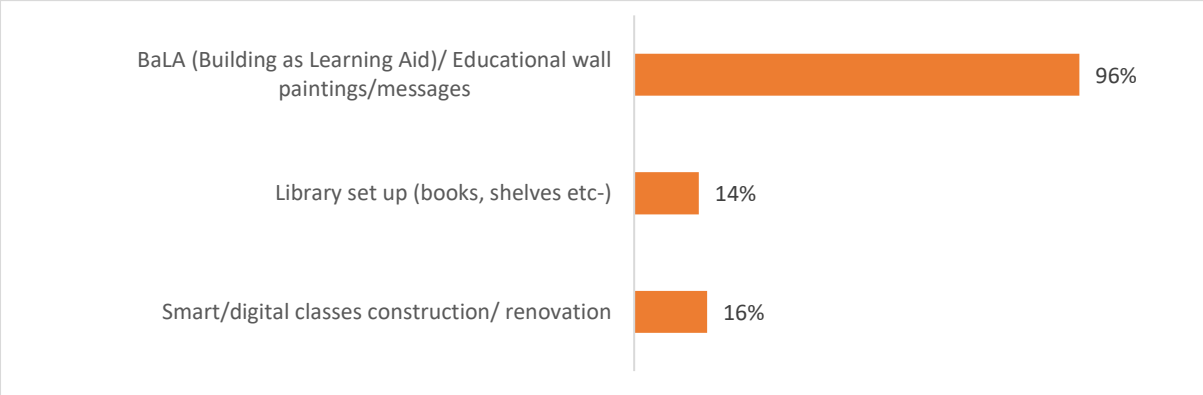
4.4.1 Infrastructure in Educational Institutions

The infrastructure of educational institutions plays a crucial role in shaping the quality of education delivered to students. To address this, the construction or renovation of smart/digital classrooms revolutionised the way students learned by providing access to digital resources, making learning more interactive and engaging. School building renovations, especially painting works, improved the aesthetics of the school environment, creating a positive and welcoming atmosphere for students, which enhanced their learning experience. The establishment of libraries provided students with access to a wide range of books and resources, promoting a reading culture among them. BaLA or educational wall paintings/messages made learning more interactive and engaging, helping students retain information better and enhancing their creativity.

HDFC Bank initiated various educational projects in Pipraoul and Trikunda villages under its thematic promotion of education program. The library establishment involved several steps: whitewashing the premises, delivering books, providing necessary furniture, and branding the space to create a conducive learning environment. Additionally, to convert traditional classrooms into smart classrooms, the bank undertook a series of tasks. These included whitewashing the classrooms, installing LED interactive touch panels to facilitate modern teaching methods, supplying benches to enhance seating arrangements, and incorporating branding elements to promote the initiative. Through these efforts, HDFC Bank aimed to significantly upgrade the

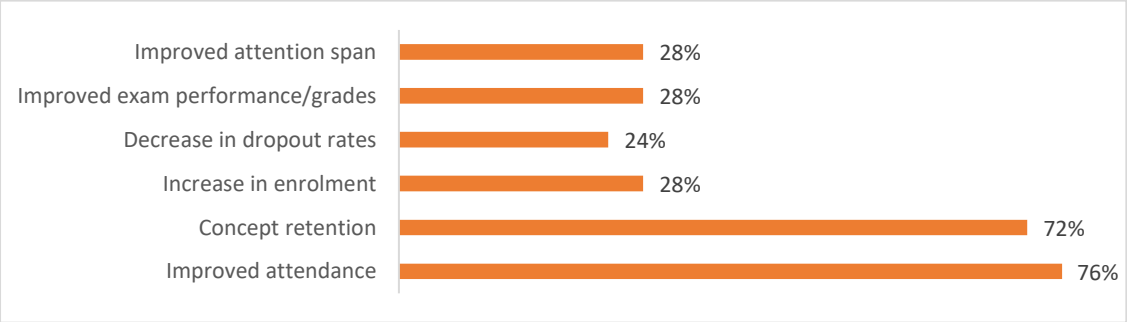
educational infrastructure and provide students with a more engaging and effective learning experience.

Figure 28: Infrastructural support provided by the project (N=57)



The HDFC Bank's HRDP initiative has provided significant support to schools in several key areas, as reflected by the responses from the beneficiaries. The most impactful contribution was in the realm of Building as Learning Aid (BaLA) and educational wall paintings, which received a substantial 96 percent response rate. This overwhelming support highlights the emphasis on making learning more interactive and engaging through visual aids and creative educational messages, which have been proven to enhance students' retention and creativity. Smart/digital classes construction or renovation also saw notable support, with 16 percent of the responses indicating that this initiative has revolutionised traditional learning methods by incorporating digital resources, thereby making the learning process more engaging and interactive for students. The establishment of libraries, encompassing the provision of books and shelves, was acknowledged by 14 percent of respondents, underlining its importance in promoting a reading culture and providing students with access to diverse educational resources.

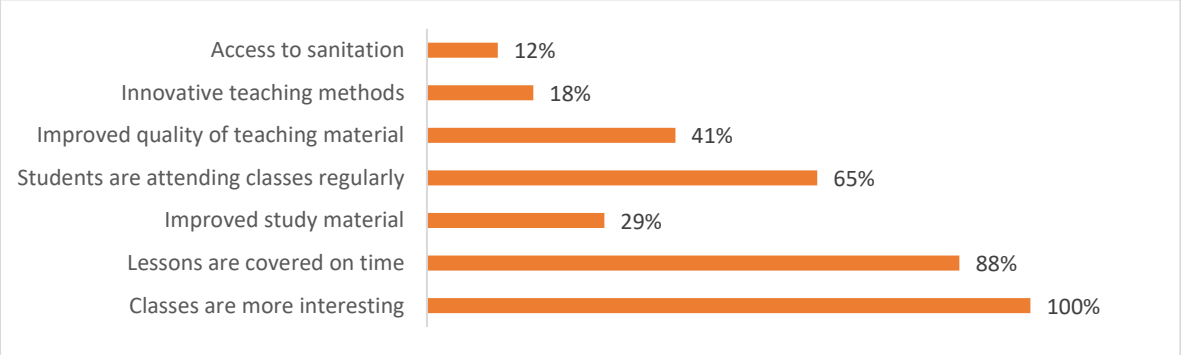
Figure 29: Perceived benefits from improvements in school activities (N=195)



The infrastructure developments initiated by the HDFC Bank's project have yielded significant positive changes among students, as reflected in the respondents' feedback. The most notable improvement was in student attendance, with a remarkable 76 percent of respondents observing better attendance rates. This suggests that the enhanced learning environment and engaging educational tools have made school more appealing to students. Concept retention also saw a substantial increase, with 72 percent of respondents noting improvements. This indicates that the interactive and engaging methods facilitated by the new infrastructure, such as smart classes

and educational wall paintings, have effectively helped students retain information better. Other positive changes, though less widespread, include a 28 percent increase in enrollment rates and improved exam performance or grades, reflecting the long-term impact of a better learning environment on academic success. Additionally, 28 percent of respondents reported improved attention spans among students, suggesting that the new, engaging learning tools help maintain students' focus. However, the decrease in dropout rates was observed by only 24 percent of respondents, indicating that while there has been some improvement, this remains an area for further attention.

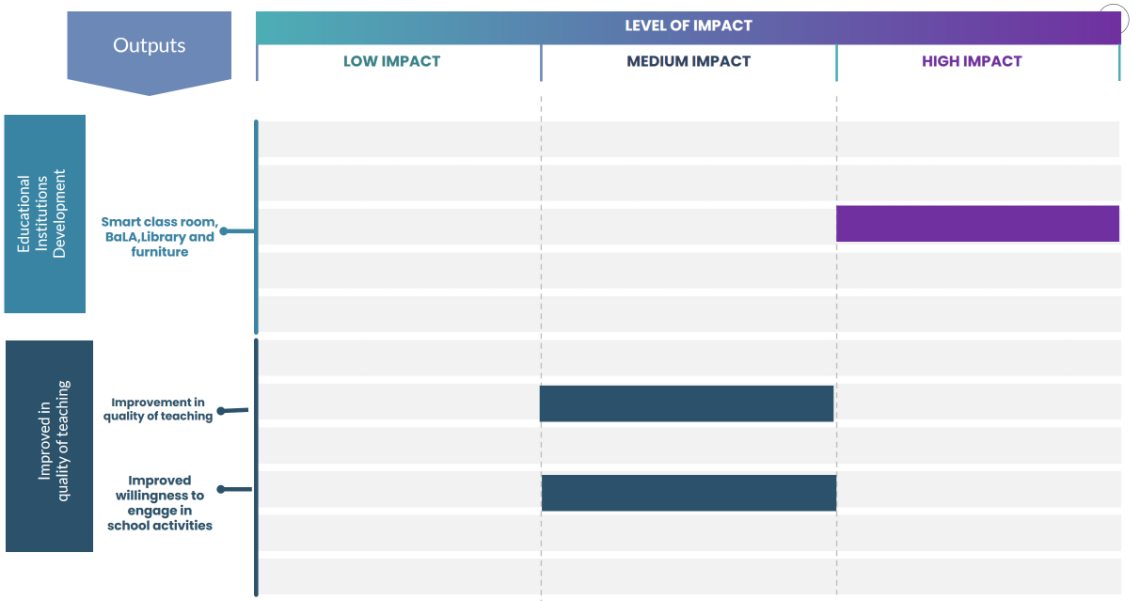
Figure 30: Perceived benefits received as per students (N=17)



The interventions in the schools, as perceived by the students, have led to significant benefits, according to respondents' feedback. A unanimous 100 percent of respondents reported that classes have become more interesting, highlighting the effectiveness of engaging and interactive teaching methods. Additionally, 88 percent noted that lessons are now covered on time, indicating improved efficiency in teaching. Regular attendance has increased, with 65 percent of respondents observing that students attend classes more consistently. The quality of teaching materials has seen a notable improvement, as reported by 41 percent of respondents, while 29 percent acknowledged enhanced study materials. Innovative teaching methods were recognised by 18 percent of respondents, suggesting that while there is some adoption of new techniques, it remains an area for growth.

4.4.2 Impact Observation

Figure 31: Level of Impact - PoE



4.5 Holistic Rural Development Index (HRDI)

There are multiple dimensions involved in achieving the goals of HRDP that includes agricultural production, generation of new jobs, enhancement of health, improved education etc., Based on the design of the HRDP program supported by HDFC Bank, a composite index has been developed called Holistic Rural Development Index (HRDI) that indicates the achievements of the HRDP interventions leading to overall improvements of the results indicators. As, the program interventions vary across projects and geographies, it was not possible to assign a single impact indicator that might be able to accurately capture the overall performance of HRDP. Thus, HRDI serves the purpose of quantifying the impact through the blending of the results of various indicators grouped into four thematic areas.

For calculation of HRDI, the values of the impact indicators at baseline and endline were selected and assigned weights based on their relative contribution to the final expected outcome across four themes. Depending on the variations in the interventions made in each project, the HRDI is customised to accommodate the most significant results that attributes to the goal of the HRDP program. The detailed methodology and indicators are explained in detail (see Annexure B).

The HRDI calculation for project P0334 implemented in Balarampur are given in the following table.

Table 6: HRDI Calculation for P0334

Domain	NRM		Skill		H&S		ED		Total	
HRDI Score	Base line	End line	Base line	End line	Base line	End line	Base line	End line	Base line	End line

	0.09	**0.14**	**0.02**	**0.15**	**0.08**	**0.14**	**0.07**	**0.13**	**0.26**	**0.55**
Percent Change	56 percent		650 percent		75 percent		86 percent		112 percent	

A noteworthy impact seen in the ST&LE category, with an outstanding 650 percent increase over the baseline. Moreover, there have been significant increases over the baseline in the "Health & Sanitation," "Promotion of Education," and "Natural Resource Management " categories, reaching 75 percent, 86 percent, and 56 percent respectively.

5 Analysis of Assessment Criteria

As outlined earlier for each thematic area, activities completed by the Udyogini were identified and assessed using the following criteria:

- Relevance and Convergence
- Impact and Effectiveness[2]
- Sustainability

The following sub-sections provide an analysis of the HRDP programme with respect to each of these criteria.

5.1 Relevance and Convergence

In India, Chhattisgarh had one of the highest percentages of Scheduled Tribes (ST) population, comprising 10% of the ST population outside the north-eastern states. According to the 2011 census, the state had a scheduled tribe population of 7,822,902, which represented 30.6% of the total population. Despite their significant presence, the community faced numerous challenges, including a poor literacy rate of 59.09%, low economic growth, a lack of empowerment, high malnutrition rates driven by communicable diseases, limited economic opportunities, and poor infrastructure in remote areas. These issues severely impacted the health and well-being of the tribal population, particularly women and children.

The HDFC's HRDP in fifteen villages of the Balarampur district was highly relevant in this context. It was designed to address the critical needs of the tribal communities in Balrampur, focusing on food and social security, income generation, and livelihood improvement. The project aimed to provide education and skill development to combat low literacy rates and a lack of empowerment, enabling individuals to seek better economic opportunities. It also focused on infrastructure development under NRM, including smart classrooms to facilitate better access to education, improving farmers' skills by linking them to markets, and installing solar drinking water posts and kitchen gardens to address health issues in remote tribal areas. By addressing these multifaceted issues, the HDFC's HRDP played a critical role in improving the quality of life for the tribal population and fostering a more inclusive and sustainable development model for Chhattisgarh.

The project showcased significant convergence with various governmental departments and initiatives to enhance the livelihood and well-being of the local tribal population. As part of the project, 1500 plants, including 500 lemon, 500 guava, and 500 jackfruit trees, were distributed among farmers. These crops were selected for their environmental friendliness and commercial value. Farmers showed keen interest in cultivating these plants, recognising their dual benefits of personal consumption and potential market sales, thereby contributing to both food security and income generation. In collaboration with the Animal Husbandry Department of the Government of Chhattisgarh, deworming and vaccination camps for goats were conducted. This initiative aimed to improve the health and productivity of livestock, which is a crucial asset for the tribal communities. Additionally, the project included backyard poultry training provided by the Animal Husbandry Department, equipping farmers with the skills to enhance poultry production, further diversifying their income source s.

[2] While from an evaluation perspective impact and effectiveness are two different aspects, in the report, these are used interchangeably.

The project also partnered with the National Rural Livelihoods Mission (NRLM) to organise organic demonstration training. This training educated farmers on sustainable agricultural practices, promoting the use of organic methods that improve soil health and crop yields while reducing dependence on chemical inputs. Such practices not only support environmental sustainability but also offer long-term economic benefits to the farmers. Through these collaborative efforts, the team effectively addressed multiple aspects of rural development, from agriculture and livestock management to health and education. The convergence of resources and expertise from various departments ensured a holistic approach to improving the quality of life for the tribal communities in these villages, fostering a sustainable and inclusive development model.

5.2 Sustainability

The sustainability of the HDFC's HRDP, implemented in collaboration with Udyogini in Ramanujganj block, is evident through the active participation and commitment of the local villagers. The initiative has garnered appreciation from the community, who have pledged to maintain the solar lights installed in their villages. For the solar pump used for lift irrigation, farmers' group were formed to oversee its operation. They proactively established a contingency fund by collecting INR 200 from each member to ensure the pump's maintenance, demonstrating their dedication to sustainable agricultural practices.

The WEGs have taken ownership of various enterprise activities introduced by the project. They received training and have gradually become self-reliant, generating income from these enterprises. Despite initial setbacks with the hi-tech nursery and bio-floc units, the WEGs remain confident and committed to turning these ventures around, learning from past mistakes and applying their hard work to achieve success.

In terms of drinking water management, water user group were formed to oversee the operation of the Jalminar system. This group collects a minimal fee from beneficiary family to create a fund for the smooth operation and maintenance of the water system, ensuring its long-term viability. The VLRAC has also achieved self-sufficiency in managing their operations. Their efforts have resulted in significant earnings from various activities, under this intervention fostering a sustainable development.

Overall, the HDFC's HRDP, supported by Udyogini, has empowered the local communities in Ramanujganj block to take control of their development initiatives. Through training, community engagement, and the establishment of self-sustaining model, the project has created a lasting impact, ensuring that the benefits continue to support the villagers long after the project's conclusion. (see Annexure E).

6 Recommendations

To further improve the outcomes of HRDP in Balrampur district of Chhattisgarh, the following recommendations are made for the HDFC Bank's Parivartan and HRDP team and the implementing partner:

Recommendations to Sustain Project Initiatives:

- The enterprises are still in their infancy and require further assistance and guidance to ensure their long-term viability. In the case of the hi-tech nursery and bio-floc unit, the women have not yet developed a thorough understanding of business and the market, which has led to significant struggles. They need additional rigorous training, support, and exposure to overcome these challenges.
- Lac has traditionally been a vital source of livelihood in Chhattisgarh. However, in the last intervention, a disconnect between the implementing partner and the farmers resulted in a complete failure. Therefore, it is crucial to provide proper support and knowledge transfer to the farmers, ensuring they are linked effectively with the market.
- The *dona pattal* unit is generating modest revenue and is seeking to expand its business by venturing into the production of paper plates and glasses. Hence additional support is recommended.
- Invest in capacity-building efforts for project beneficiaries, including training programs and skill development workshops. By equipping individuals with the necessary knowledge and skills, they can effectively manage project initiatives and adapt to changing circumstances, thereby enhancing the sustainability of the project in the long run.

Recommendations to Build Project Efficiency

- To ensure the success of the intervention, each village must develop a local cadre of trained individuals to serve as village resource coordinators. These coordinators will be the primary point of contact for all intervention-related matters and will be accountable to the villagers. They will provide information on farm advisory services, disease management, vaccination schedules, deworming schedules, and other emergencies.
- Integrate technology solutions like project management software or mobile applications to automate tasks, improve communication, and track progress more efficiently at the beneficiary level.
- Perform comprehensive reviews and need assessments to identify potential challenges and opportunities within the current project methodologies. Implement suitable interventions based on the findings to enhance the effectiveness and precision of the outcomes.

Recommendations to Strengthen Project Design

- Involve key stakeholders, including beneficiaries and community members, in the project design process to ensure their needs and perspectives are considered and incorporated into the plans.
- Systematising the project monitoring and backstopping process and synchronising engagement of HDFC program staff and the implementing partner.

Annexures

A Sampling Methodology

The quantitative household survey was administered for four thematic areas in the district.

A.1 Quantitative Sample Size Calculation

For this study, the formula for calculation of finite sample size for one-time cross-sectional survey (Cochran's 1977), has been deemed appropriate. The formula used to estimate the sample size for the quantitative household survey is given below:

$$N = Z_{1-\alpha}^2 \times P\,(1-P)\, \times D_{eff} \div\, (S_e)^2$$

Where,

N= sample size

P= key characteristic of the population, set at 50 percent;

$Z_{1-\alpha}$= standard score corresponding to the confidence interval, set at 95 percent (1.96 for two tailed test);

S_e= margin of error, set at 5 percent;

D_{eff}= factor for design effect, set at 1 (no design effect)

Thus, the estimated maximum sample size is *(enter number).*

A.2 Quantitative Sampling Methodology

All the ten project villages were selected for the study. The stages of sampling are explained as follows:

Stage 1 – Selection of beneficiaries:

The list of beneficiaries from all the nine villages acted as the sampling frame for the project. This list was obtained from the implementing partner – Udyogini. Simple random sampling was done to select the required number of households from within the list. Since beneficiary selection was undertaken independently for each project, the selection of more than one beneficiary from a single household was probable.

Stage 2- Sampling for villages:

Sampling for each village was done using the Probability Proportionate to Size (PPS) method. The percentage of the total number of beneficiaries in a village was taken out from the total beneficiaries. This percentage was then converted into a sample per village. A total of nine villages were covered under the survey.

A.3 Qualitative Sample Size Calculation

Qualitative tools of In-depth Interviews (IDIs) and Focus Group Discussions (FGDs) were administered for obtaining information about the remaining themes as well as to enrich the household survey information with a deeper understanding.

Since there was no baseline available for this evaluation, recall method was used in the household survey to assess the change that has happened over time. For this purpose, the respondents were

asked to recall the value of critical indicators that they could recall from the time the programme started.

B HRDI Methodology

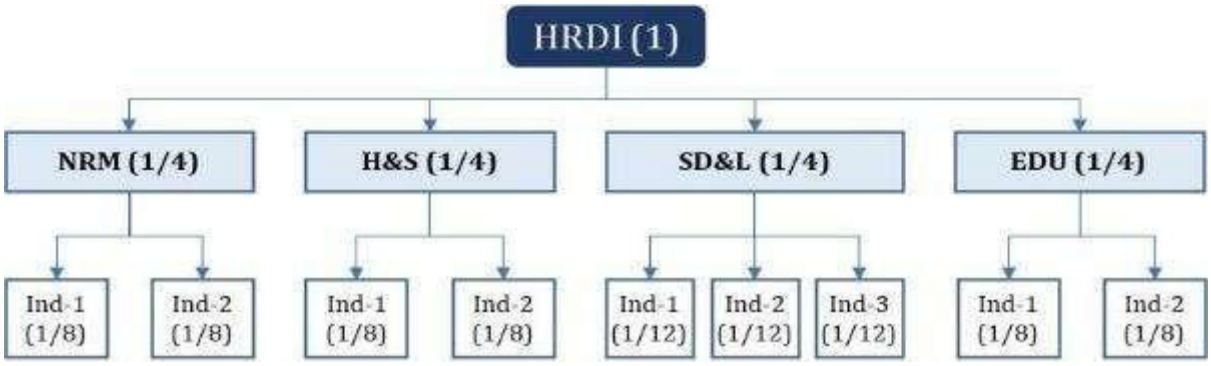
The outcome indicators included in the HRDI were obtained from different domains and are consequently measured on different scales. Therefore, to ensure the comparability of these indicators, all the indicators were converted into discrete variables such that the indicators could be measured between 0 and 1. Indicators such as productivity and income which were measured on a continuous scale were converted to discrete variables by setting a cut-off. The 50th percentile of these indicators at baseline was chosen as the cut-off point. Thus, a change in the indicator could be captured by recording the proportion of beneficiaries above the cut-off at two distinct points in time.

B.1 Indicator Weights

Weights were applied to each of these indicators, in similar lines with the HRDI calculation. Attribution of equal weights to all the domains were done in order to create a standard HRDI for each cluster.

Equal weights were assigned to each of the four domains. Further, the domain weight was equally distributed among the indicators of that domain; thereby ensuring that equal weightage of the domains was maintained overall.

Figure 32: Domain and Indicator Weights



The example above is indicative. The domains as well as indicators were different across all programmes, and hence the weights were changed slightly for the purpose of the study, following the principle stated above.

Table 7: Example of HRDI Calculation

Thematic Area	Indicators	**Formula**
NRM	Proportion of farmers with net income above median	(1/4) x (1/3) = 0.083
	Proportion of farmers reporting increased productivity of three main crops above median (before and after)	(1/4) x (1/3) = 0.083
	Percentage of farmers reporting access to irrigation	(1/4) x (1/3) = 0.083
ST&LE	Percentage of households who are getting skill training & reporting increase in income from job/enterprise/self-employment	(1/4) x (1/2) = 0.125
	Percentage of HH reporting income above median from livestock	(1/4) x (1/2) = 0.125

H&S	Percentage of households reporting increase in use of fruits/vegetables from the nutrition garden	(1/4) x (1/3) = 0.083
	Percentage of households reporting increase availability of drinking water facility	(1/4) x (1/3) = 0.083
	Percentage of households with access to improved toilet facility	(1/4) x(1/3) = 0.083
PoE	Percentage of respondents reporting increased access to functional school physical infrastructure (drinking water posts, separate washrooms, furniture etc.)	(1/4) x (1/2) = 0.125
	Percentage of respondents reporting increased access to functional learning infrastructure (library, science labs, smart class, etc.)	(1/4) x (1/2) = 0.125

Once all the indicators were standardized and weighted, a sum of these weighted indicators was utilized to calculate the value of HRDI.

B.2 Analysis Plan

HRDI for each district was calculated at two points in time i.e., before and after HRDP and can be compared cross-sectionally to understand which indicators contributed to an increase or decrease in HRDI value. Since the value attribution of the indicators is in proportion, the HRDI value numerically ranges between 0 and 1. Once all the indicators are standardized and weighted, a sum of these weighted indicators are utilized to calculate the value of HRDI.

B.3 Method to Calculate HRDI

Step 1: All the indicators were cleaned and adjusted for outliers. Only those beneficiaries were considered for the analysis where data on outcome indicators was available for both pre- and post-intervention.

Step 2: A cut-off value was calculated by taking the 50th percentile for each indicator before HRDP (baseline). For instance, consider the indicator, Average Annual Income of Farmers. It was considered at baseline, then all the farmers were sorted across the seven blocks/villages in ascending order based on their income. The 50th percentile i.e., the median value of the income was taken. This median or 50th percentile was taken as the cut-off (baseline cut-off to be precise).

Step 3: Calculated the proportion of beneficiaries above the set cut-off value at the baseline for each indicator.

Step 4: Calculated the same at the endline i.e., the proportion of beneficiaries above the baseline cut-off for each indicator.

Step 5: Multiplied each proportion of the indicators with the set indicator weights.

Step 6: Summed up all the indicators (i.e., weighted sum) to calculate the HRDI value at baseline and endline.

Step 7: Calculated the relative change in the HRDI value from baseline to endline.

The calculation for Karauli has been detailed below (see **Error! Reference source not found.**9).

Table 8: HRDI Calculation for Balarampur

Domain	Indicators	Baseline	HRDI	End line	HRDI	percent Change
NRM	Proportion of farmers with net income above median	0.50	0.09	0.75	0.14	56 percent

Domain	Indicators	Baseline	HRDI	End line	HRDI	percent Change
	Proportion of farmers reporting increased productivity of three main crops above median (before and after)	0.28		0.49		
	Percentage of farmers reporting access to irrigation	0.28		0.4		
ST&LE	Percentage of HH reporting income above median from livestock	0.19	0.02	0.45	0.15	650 percent
	Percentage of households who getting skill training & reporting increase in income from job/enterprise/self employment	0.08		0.83		
H&S	Percentage of households reporting increase availability of drinking water facility	0.12	0.08	0.26	0.14	75 percent
	Percentage of households with access to improved toilet facility	0.73		1.00		
	Percentage of households reporting increase in use of fruits/vegetables from the nutrition garden	0.12		0.47		
PoE	Percentage of respondents reporting increased access to functional school physical infrastructure (drinking water posts, separate washrooms, furniture etc.)	0.53	0.07	1.00	0.13	86 percent
	Percentage of respondents reporting increased access to functional learning infrastructure (library, science labs, smart class, etc.)	0.00		0.00		
Total			**0.26**		**0.55**	**112 percent**

C Overview of Impact Calculation

Impact of the programme was calculated based on the averages of quantitative output indicators as demonstrated below (see **Error! Reference source not found.**0).

Table 9: Impact Calculation

Outputs	Output Indicators		Output Avg	Impact Level
NA. Increased income from agriculture				
Land/ crop productivity	Proportion of farmers reporting increased productivity of three main crops above median	42 percent	66 percent	Medium
	Proportion of farmers reporting increased income from crops that were supported under HRDP.	88 percent		
	Proportion of farmers who are the above median range	68 percent		
Access to the farm management infrastructure	Proportion of beneficiaries satisfied with the quality of available services (in farm management)	85 percent	66 percent	Medium
	Proportion of farmers who use both, chemical and natural fertilizers	79 percent		
	The proportion of farmers reporting a decrease in the use of chemical fertilizers	33 percent		
Increased adoption of crop diversification	Proportion of farmers diversifying their crops with the project support.	87 percent	83 pecent	High
	Proportion of farmers who report income increase due to crop diversification (base = farmers who adopted crop diversification)	78 percent		
Land under irrigation	Increased area under irrigation	-	4 percent	
	Pproportion of farmers who received support for irrigation	7 pecent		
Increased use of clean energy solutions				
Adoption of clean energy infrastructure	Proportion of HHs using clean energy infrastructure (Base=all)	75 percent	87 percent	High
	Proportion of households fully satisfied from using clean energy infrastructure (Base=clean energy beneficiaries)	99 Percent		
Improved access to agricultural training and services				
Access to Agriculture training and services	Proportion of farmers who reported project training services are useful	99 percent	75 percent	HIgh
	Proportion of farmers who demonstrate awareness regarding sustainable farming practices	55 percent		
Adoption of improved farming practices	Proportion of farmers who continue to practise conservation agricultural practices	28 percent	58 percent	Medium

	Proportion of beneficiaries reporting an increase in productivity due to better farm management	81 percent		
	Proportion of farmers reporting increased income	65 percent		
Enhanced capacity for regular income generation				
Enhanced employable skill development	Percentage of women who accessed skill development training	92 percent	80 percent	High
	Percentage of women who report improved income through skill development	68 percent		
	Proportionate increase in average income from enterprise	-		
	Percentage of women who report increased savings through skill development	-		
Improved capacity to generate income through livestock management				
Adoption of scientific management of livestock	Proportion of beneficiaries who received support in livestock management services	72 percent	62 percent	Medium
	Proportion of beneficiaries reporting an increase in income from livestock management	92 percent		
	Proportion of beneficiaries reporting improved livestock health	35 percent		
	Percentage of HH reporting income above median from livestock	47 percent		
Improved health infrastructure and services(Kitchen Garden)				
Establishment/ enhancement of health infrastructure and services	Proportion of households who reported Reduced expenditure on food	94 percent	72percent	High
	Proportion of households who reported as an additional source of income	64 percent		
	Proportion of households who reported as improved nutrition	36 percent		
	Proportion of households who are satisfied with the intervention	93 percent		
Improved sanitation infrastructure and services				
Establishment/ enhancement of sanitation infrastructure.	Proportion of beneficiaries who gained access to sanitation services			
	Proportion of HHs with access to Household/community sanitation units (toilets/bathing enclosures)			
	Proportion of beneficiaries reporting safety of women due to improved access			
Awareness regarding health and sanitation	Improved awareness regarding cleanliness and sanitation practices			

practices	(Using toilets instead of open defecation)			
	Improved awareness regarding waste management			
Adoption of positive health and sanitation practices	Increase in no. of HHs adopting proper solid waste management practices			
	Increase in no of HHs adopting proper liquid waste management practices			
Improved availability and management of water				
Access to drinking water at household and community levels improved	The proportionate number of HHs reporting change in source of drinking water	60 percent	46 percent	Medium
	The proportion of households reporting improved well-being due to the availability of clean drinking water.	32 percernt		
Improved capacity of educational institutions to provide services				
Access to improved physical infrastructure	Proportion of students/schools who report gaining access to functioning smart classrooms/ Bala/science labs/libraries/learning aid/furniture/sports equipment	85 percent	85 percent	High
	Proportion of schools who gained access to clean and functioning sanitation units/drinking water posts at education institutions	-		
Improvements in quality of teaching	Proportion of teachers regularly utilizing smart classrooms/libraries/science lab (Regularly= Everyday+ Most days)	64 percent	50 percent	Medium
	Proportion of students who regularly use smart classrooms/science labs/ libraries for lessons ((Regularly= Everyday+ Most days)	36 percent		
Improved willingness to engage in school activities	Teachers reporting improvements in attendance due to improved infrastructure	76 percent	67 percent	Medium
	Proportion of teachers reporting improvements in learning outcomes due to infrastructural facilities at institutions (concept retention)	72 percent		
	Proportion of institutions reporting a decrease in dropout rates and increasing enrollment	52 percent		

Change	Impact Level
0%-40%	**Low**
>40% - 70%	**Medium**
>70%- 100%	**High**

D Two Sample Proportions Z Test

The two-sample proportions z-test is a statistical hypothesis test used to determine whether two proportions are different from each other. The null hypothesis of the test is that the two proportions are equal, while the alternative hypothesis is that the two proportions are not equal.

The test statistic for the two-sample proportions z-test is given by the following formula:

z = (p1 - p2) / sqrt(p*(1-p)/(n1 + n2))
where:

p1 is the proportion in the first sample
p2 is the proportion in the second sample
p is the pooled proportion, calculated as (p1n1 + p2n2)/(n1 + n2)
n1 is the sample size of the first sample
n2 is the sample size of the second sample
The z-statistic is then compared to the standard normal distribution to determine the p-value of the test. A p-value less than alpha (typically 0.05) indicates that the null hypothesis can be rejected, and there is evidence to suggest that the two proportions are different.

The two-sample proportions z-test can be used to test for a difference in proportions between two groups of people, such as men and women, or two different brands of products. The test can also be used to compare the proportions of two different populations, such as the population of a city and the population of a state.

Here are some of the assumptions of the two-sample proportions z-test:

- The two samples are independent.
- The two populations are normally distributed.
- The sample sizes are large enough (n1p1n2*p2 > 10) (Basically the Central Limit theorem should apply for the sampling distribution of the z-statistic can be approximated by the standard normal distribution.)

If these assumptions are not met, the results of the test may not be reliable.

The two-sample proportions z-test is a powerful tool for comparing two proportions. However, it is important to be aware of the assumptions of the test and to ensure that the data meets these assumptions before using the test.

Assumptions:

- Independence: The two samples must be independent of each other.
- Normality: The two populations must be normally distributed, or the sample sizes must be large enough (n1p1n2*p2 > 10).
- Binomial distribution: The population does not need to follow a binomial distribution, but the test is more powerful if it does.

The z-test conducted for one indicator- Proportion of farmers with average productivity of paddy above baseline median-is shown below.

Table 10: Z - Test conducted for P0334

Indicator	Proportion of farmers with average productivity of paddy above baseline median
p1 (proportion of first sample-endline)	68
n1 (sample size of p1)	94
p2 (proportion of second sample-baseline)	49
n2 (sample size of p2)	94
p	0.622340426
Calculation	0.070715616
z statistic	2.686818154
	Statistically significant as it is less than our alpha value (0.05)
p-value for the z statistic	0.003607

E Theme-wise Sustainability Matrix

The programme support provided demonstrated the capability to continue even after the programme ended. The programme's support to sustain improved outcomes are enumerated below (see **Error! Reference source not found.**).

Table 11: Theme wise sustainability matrix

Support Provided	Structures Established	Technical Know-how	Usage	Maintenance
NRM				
Irrigation Management	✓	✓	✓	✓
Farm Management	✓	✓	✓	✓
Clean Energy	✓		✓	
ST&LE				
Agriculture Training and Support	✓		✓	✓
Entrepreneurship Development	✓	✓	✓	
Livestock Management	✓	✓	✓	
H&S				
Health	✓		✓	
Sanitation		✓	✓	
P				
Educational Institutions Development	✓	✓	✓	

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