Impact Assessment Study of Holistic Rural Development Programme (HRDP) Ramgarh, Jharkhand – P0249

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 evaluating the impact of the Holistic Rural Development Programme (HRDP) implemented by HDFC Bank and executed by Krishi Gram Vikas Kendra (KGVK) in the Ramgarh district of Jharkhand from April 2018 to September 2022. This research primarily focuses on comprehending the overall processes undertaken by HDFC Bank and the implementing organization throughout the programme's activities. It explores key milestones, assesses the impact generated, and identifies challenges encountered. The intervention's key areas are 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 Development Assistance Committee (DAC) criteria - Relevance, Effectiveness, and Sustainability. A comprehensive methodology, comprising both qualitative and quantitative primary data collection, was used for the assessment involving all the key stakeholders of the programme. The study included a total sample size of 400 beneficiaries as respondents as against the planned sample of 400.

Natural Resources Management

HRDP focused on interventions under natural resource management, encompassing activities such as farm pond construction/renovation, drip irrigation with poly mulching, pond de-siltation, gravity-based irrigation channel construction, low land well construction, and solar streetlights. **The project resulted in a 60% increase in gross income and a 70% increase in net income of the beneficiary farmers.** Despite a 33% rise in input costs, there has been a positive shift in gross and net income trends over baseline. Farmers reported enhanced productivity and benefits from using natural fertilisers. Notably, 31% of farmers have ventured into horticulture fruit cultivation, with papaya being the predominant choice (85%). This signifies a diversification in agricultural practices, contributing to increased income. These interventions have significantly impacted the local population, transforming traditional agriculture practices. Farmers highlight how these practices foster a deeper understanding of collaborative resource management for the collective benefit of all stakeholders. Interventions ensuring irrigation assurance have prompted many farmers to adopt double cropping, indicating a fundamental shift towards increased agricultural efficiency and income. The adoption of strawberry cultivation, even by farmers without formal training, reflects the successful demonstration effect of HDFC-led initiatives, showcasing the potential for knowledge transfer and innovation within the community. Installation of solar streetlights, with a reach to 88% of respondents, underscores the project's impact providing lighting during the evening which increased mobility of children and women. This not only enhances visibility and safety but also signifies a broader reach of the project within the community.

Skill Training and Livelihood Enhancement

Under skill training and livelihood enhancement, the project conducted agricultural training, the formation of Self-Help Groups (SHGs), and livestock interventions, including distribution and training in goatry, piggery, and fisheries. A noteworthy 58% of households experienced the benefits of agricultural training, resulting in an increase in productivity in the project villages. This indicates that farmers have applied the acquired skills, leading to more efficient farming practices. SHG promotion and enterprise support was provided to 18% respondents, empowering women with entrepreneurial opportunities, underscoring the project's commitment to fostering gender inclusivity. Entrepreneur training and support in setting up ventures such as tent house and rice huller machine were provided to SHG women members and these are currently operational post completion of the project. **Livestock interventions have improved the**

economic well-being of the community. Approximately 27% of respondents reported 65% increase in household income and 57% improvement in livestock health reducing risk of mortality. Farmers have reported increased use of natural fertilisers, which is evident of improved awareness among farmers on the importance of organic farming for better soil health and fertility. This demonstrates that the project's effort was not only imparting skill training but also facilitating the practical application of these skills through viable business initiatives.

Health and Sanitation

The health and sanitation interventions included human health camps, solar power operated community bathing units, drinking water supply systems (Jalminar) and promotion of kitchen garden. 68% of the respondents reported that they attended health camps organised under the project. **Kitchen garden support resulted in reduced household expenses of about INR 1000 per month for buying vegetables along with access to nutritious food.** The community bathrooms aided in improving the quality of life for women and Jalminar drinking water system helped in curbing the spread of water borne diseases in the project villages as reported by 70% of respondents.

Promotion of Education

A combination of multiple activities targeted towards improving enrolment, attendance, and learning outcomes were undertaken in schools located in the project villages. It focused on Educational Institutions Development support that includes school library construction, construction of building as learning aid (BaLA) wall paintings, establishing smart classes, and awareness activities among parents & children. The smart classes, library setup and BaLA paintings enhanced students' reading and comprehension ability. About 79% of teachers reported reduced dropout rates, and 100% reported increased attendance due to these interventions. Awareness campaigns further helped children understand the significance of sanitation and hygiene practices. Adult literacy sessions were also organised to enhance the overall educational outcomes in the project area.

Table 1: Summary of Key Income Indicators

Income Indicators (based on median)	Before	After	% Change
Average Net Income from Agriculture (INR)	35,000	59,500	70%
Average Income from Livestock (INR) (mean)	3,694	8,945	142%
Average Productivity of two major crops (Qtl. /Acre)	12.83 Qtl/acre	19.5 Qtl/acre	52%

The above table indicates that there is an increase of average net income from agriculture. This is primarily due to project's support in promoting improved farm management along with organic farming. Both the interventions increased the productivity of crops during the project execution. There has been a positive change in income from livestock rearing particularly from piggery, goat rearing, and fisheries in the project villages. Most of these livestock-based livelihood activities were new to the communities. Fisheries taken in the check dams created under the project have been beneficial to increase household income of the beneficiaries' households.

HRDI Indicators

The Holistic Rural Development Index (HRDI)[1] score for the project indicates a medium impact at 0.82[2] from the baseline HRDI of 0.48. There is a 40% increase in NRM HRDI score which could be attributed to better access to farm and water management, irrigation interventions, trainings on crop diversification and organic farming. Skill training and livelihood enhancement shows an increase of 100% due to the introduction of planned livestock income generation and fodder development interventions which was not being practiced earlier by these communities. Health & sanitation shows a notable 109% percentage change in HRDI score over baseline which is due to improvement in sanitation and drinking water infrastructures along with better awareness, knowledge, and adoption of health & hygiene practices among women members. Educational initiatives led to a 33% change in HRDI scores. This increase is attributed to better access to functional school infrastructure (smart classes and furniture) and learning infrastructure in the schools. The HRDI score for H&S and ST&LE are 100% owing to the lack of such infrastructure during the baseline. The following table provides the thematic area wise HRDI score.

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
	0.10	**0.14**	**0.12**	**0.24**	**0.11**	**0.23**	**0.15**	**0.20**	**0.48**	**0.82**
% Change	40%		100%		109%		33%		71%	

Recommendations

- The demand for installation of more water pumps and solar irrigation systems as irrigation continues to be a challenge in the region. Provision of additional resources and/or convergence with government schemes may be facilitated by the implementing partner to sustain the growth trends in agriculture.
- For a committed push to organic agriculture and to sustain the efforts made under the project, the implementing partner may organize the farmers into Farmer Producer Organization (FPO) and support them in operating at an aggregate level while continuing the input and skill support to the farmers.
- Handholding support to SHGs for promoting rural enterprises is required as there is a lack of opportunities for taking up income generation activities in the project villages other than in agriculture. Training on market linkage, business plan development and linkages with government schemes, etc. is essential for the SHG's that are currently involved in only savings, inter loaning and bookkeeping activities.
- There is a need for expanding the coverage of piped water supply to villages as the accessibility to safe drinking water continues to be a challenge in the area. Since villages are spread out, more Jalminar structures in remote *tolas* are urgently needed. This may be linked with the Jal Jeevan Mission implemented by the Gram Panchayats with the support from the Government of India to provide safe and adequate drinking water through individual household tap connections by 2024 to all households in rural areas.

[1] To evaluate the impact of the interventions, the study has employed the existing HRDI created by the programme. The HRDI is arrived at by defining key outcome indicators for each of the domains and developing a composite index.

[2] Overall HRDI scores for different clusters will range from 0 to 1, with: 0 being Low/Poor and 1 being High/Best
- For instance: 0 to 0.33: Poor/Low; 0.34 to 0.66: Moderate/Medium; 0.67 to 1: High/Best (Good)

1 Introduction

India has experienced massive strides in rural development over the years. While 65% of the country's population live in rural areas (as of 2021), 47% are still dependent on agriculture for their livelihood (PIB Delhi, 2023). The rural ecosystem grew by around 10% per annum during the last 5 years but it continues to be plagued by numerous problems, such as lack of irrigation, degrading soil health, disguised unemployment, fewer skill development avenues, undependable healthcare availability, low literacy rates, and increasing environmental degradation, etc. To mitigate these diverse yet inter-linked developmental challenges, the HDFC Bank, under its Corporate Social Responsibility (CSR) initiative '*Parivartan'*, supports numerous programmes that deliver holistic rural development to aid 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 the 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 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 learnt and good practices

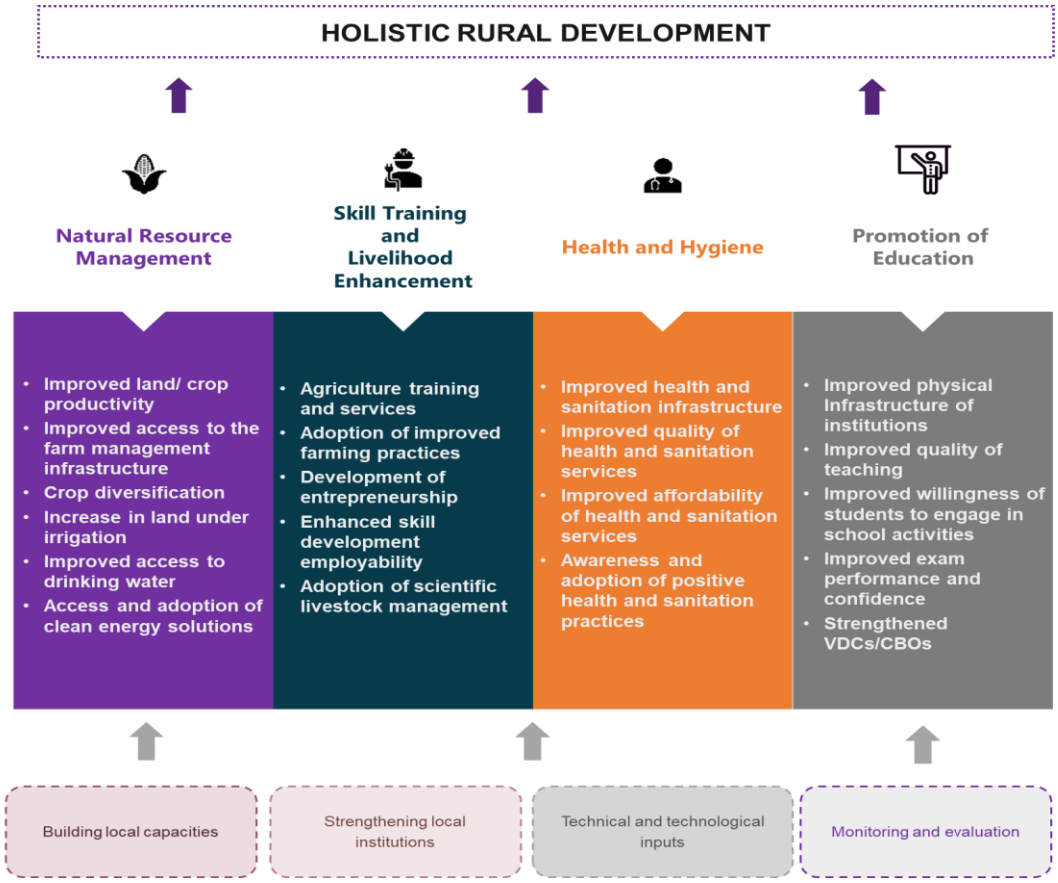
- Provide evidence-based findings to inform future operational and strategic decisions while planning and funding partner organisations

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

1.3 Conceptual Framework Adopted

The conceptual framework and the areas covered under the assessment are depicted below (see Figure 1). The aim is to build local capacities and strengthen local institutions, while giving technical inputs and conducting evaluation 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

The assessment provides an independent, third-party, detailed assessment report of HDFC Bank's HRDP intervention (under *Parivartan*) carried out in a backward district of Jharkhand, Ramgarh, by Krishi Gram Vikas Kendra (KGVK), the implementing partner in this district. The programme was undertaken during April 2018 till September 2022 and the interventions covered 14 villages across the Ramgarh district. The villages were selected as they face challenges in the form of water scarcity, single cropping pattern, and inadequate income from agriculture along with societal challenges.

1.5 About the Implementing Partner – KGVK

Since 1972, KGVK is working towards sustainable & integrated development in rural Jharkhand through convergent efforts of the government, corporate bodies, NGOs, scientific institutions, and community. The P4 model of Public-Private-People's Partnership is the key force behind rural transformation through Total Village Management (TVM), which is enabling people to fulfil their potential and helping them to help themselves. KGVK relies on the approach of "Quality Circles" or "Problem Solving Groups" within the villages who identify problems themselves, find root cause of the problem, make action plan (5W-1H-1C Format) and implement interventions in a timely, effective and efficient fashion by the people themselves.

KGVK has an integrated approach of rural development through the proprietary TVM model; TVM is based on strong business principles adapted to rural setting, community ownership and grassroots entrepreneurship. The eight pillars of TVM – Natural Resources Management; Health: Nutrition & Sanitation; Education; Renewable Energy; Livelihood; Women's Empowerment; Capacity Building; Resource Mobilisation; Infrastructure Development – work together in a convergent manner and are well tied to the local governance structure and communities to ensure smooth implementation and long-term sustainability.

2 Research Design and Methodology

The assessment used both, qualitative and quantitative methods. The process was carried out in a consultative manner involving interactions at key junctures with, both, HDFC Bank and Krishi Gram Vikas Kendra.

2.1 Criteria for Assessment

For each thematic area, activities completed by the Krishi Gram Vikas Kendra were identified. The impact of these activities was assessed using the following criteria:

- Relevance and Convergence
- Impact and Effectiveness[3]
- Sustainability

Under the criterion of **relevance and convergence**, the team assessed whether the design of the programme 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) Convergent 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 programme, the team established the values of outcome indicators of all thematic interventions. The findings were assessed against the outcome indicators finalized during the outcome harvesting stage. Through qualitative evidence and analysis of programme outcomes (in light of variables identified in consultation with HDFC Bank), the team tried to understand whether and how the programme impacted the lives of community members in the programme areas. The findings from primary quantitative data were substantiated by the information gathered from discussions with the communities/beneficiaries, teachers, students, entrepreneurs, and local village-level institutions.

For the criteria of **sustainability,** the team studied the primary data to understand if the programme has worked on strengthening the community's capacity 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 as well as in-depth interviews (IDIs), Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) with programme beneficiaries, KGVK team, and the HDFC Bank programme team. IDIs were conducted with the farmer beneficiaries, implementing partner, schoolteachers, livestock beneficiaries and Anganwadi teachers. FGDs were conducted with farmers group, self-help groups and with the Kishori *Samuh* members of the villages. KIIs were conducted with the community resource persons from villages. The outcome mapping and result chain development was undertaken in consultation with the HDFC Bank team. Standardized key outcomes and indicators were

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

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.

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/literature related to the programme.

2.3 Sample Size and Distribution

From the fourteen villages of Ramgarh where the programme was implemented, beneficiaries were selected from eight villages across the three blocks using purposive random sampling from a list of beneficiaries obtained from KGVK team. 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. Inclusion of beneficiaries for all thematic areas was ensured. The target sample size across eight villages was 400, out of which all 400 sample respondents were reached. The thematic areas wise sample covered is as follows, the total numbers being mutually inclusive considering the repetition of beneficiaries for more than one category (see, Table 3).

Table 3: Population Sample Covered

Block Name	NRM	ST&LE	H&S	PoE[4]
Patratu	93	73	85	11
Ramgarh[5]	152	120	132	20
Dumli	148	115	125	15
Total	393	308	342	46

Qualitative tools of in-depth interviews (IDIs) and focus group discussions (FGDs) were administered for obtaining information about the various themes as well as to enrich the household survey information with a deeper understanding. A total of eight FGD's with SHGs, farmer groups and Kishori *samuh* were conducted in the project area. A total of 6 IDI's were

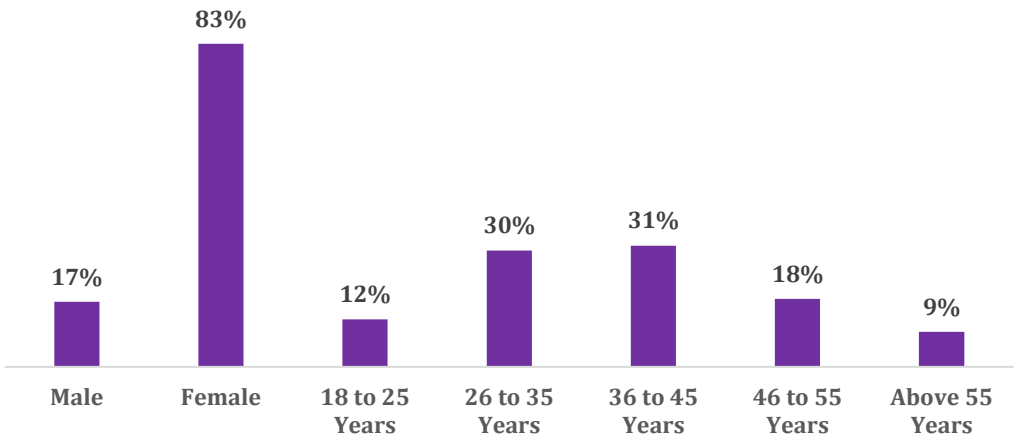
[4] The limited sample covered in few of the villages was due to the unavailability of respondents with respect to education. As the field survey covered weekends and holidays the teachers and students could not be surveyed.

[5] To be noted that Ramgarh denotes both the district in Jharkhand and one of the blocks in the region.

conducted amongst schoolteachers, farmers, community resource persons, and 5 Key Information Interviews (KIIs) with strawberry plantation beneficiary, animal healthcare workers, implementing partners, and beneficiaries were conducted.

The total sample includes 17% males and 83% females. The highest number of respondents, 30% belonged to the age category of 26-35 and 36-45 years. This was followed by 18% of the respondents belonging to 46-55 years, and 12% belonging to 18-25 age category. See, Figure 2.

Figure 2: Gender and Age Group wise distribution of Sample



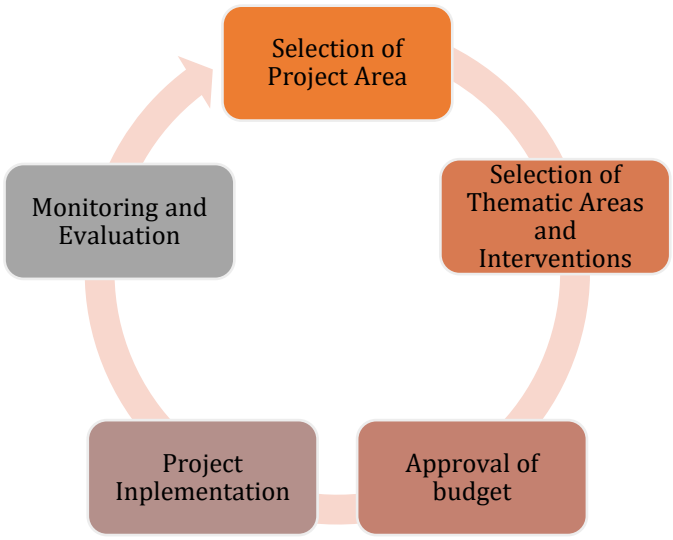
2.4 Training of Enumerators

A gender balanced survey team consisting of 6 local enumerators and 1 supervisor was recruited with 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 briefed 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.

3 Programme Planning and Implementation

The planning and implementation of the programme involves five stages: selection of the geographical area viz. district, block, villages etc., selection of thematic areas and interventions, approval of budget, programme implementation, and monitoring and evaluation. These stages are further explained below.

Figure 3: Planning and Implementation Process



3.1 Selection of Project Area

Ramgarh district in Jharkhand is situated in the sub-humid region of the Chotanagpur Plateau and experiences a semi-extreme climate. According to the 2011 census, the district has a population of 9,49,159 people. The primary sources of livelihoods for most households are rainfed agriculture, manual labour, and small shop businesses. Villages rely on mono-cropping, cultivating crops such as paddy, wheat, mustard, and vegetables using traditional methods, leading to income insecurity. Irrigation is primarily sourced from wells, ponds, and dams, with limited coverage and scope. While all villages have electricity, the absence of lighting in common areas poses safety concerns, especially at night.

Alternate income sources include traditional practices like backyard duck rearing, poultry, goat rearing, and pig farming, lacking structure as income-generating activities. Livestock management lacks organized information on food and health requirements. SHGs exist but primarily engage in internal saving and credit, lacking established enterprises or skill-based initiatives. The education system faces challenges with outdated infrastructure and washrooms, and higher secondary students must leave villages for nearby cities for higher education. Drinking water sources mainly rely on ponds and handpumps, contributing to various health issues and placing a burden on women fetching water.

Addressing these challenges, HRDP interventions focus on water management, farm management, and clean energy promotion. The project emphasizes agricultural and skill training, livestock management, SHG development, educational institution enhancement, and health awareness. Activities tailored to each village are determined through thorough consultations with

Village Development Committees (VDCs) formed at the project's outset. Specific initiatives in each thematic area that are subsequently implemented are mentioned below (see Table 4).

Table 4: Activities under Four Thematic Areas in Ramgarh

Activity Category	Activities	Output Indicators
NRM		
Irrigation Management	Multi-Tier Cropping System, SRI Training, Azola, Construction of Zero Energy Cool Chamber (ZECC)	Income from agriculture
Farm Management	Farm Pond Construction/ Renovation, Drip Irrigation with poly mulching, Check Dam, Desiltation of Pond, Gravity based irrigation channel construction, Low Land Well Construction	Income from agriculture
Horticulture/ Wadis	Guava Cultivation, Papaya Cultivation, Mango Cultivation, Yam Cultivation	Income from agriculture
Clean Energy	Solar Streetlights	Access to light
ST&LE		
Agriculture Training and Services	Training on Vermi Compost, Farmer Field School Exposure Visits, Training on Organic Methods Zero Budget, Training of farmers towards collective marketing, Training on Mushroom Cultivation, Training on Formation and Application of organic soil fertility	Access to Agriculture Training and Services
SHG Based Women Empowerment	Training on Micro Enterprises development for SHG & Adolescent Girls, Tent House (SHG), Mushroom Production Unit (SHG), Rice Huller Machine (SHG), Cono weeder and Paddy Thresher (SHG)	Skill and Entrepreneurship Development
Livestock Management	Piggery, Goatry, Fishery, Training of Animal Health Worker, Animal Health Camps	Livestock Management
H&S		
Health	Health Camps, Haemoglobin camps for adolescent girls	Health Services
Sanitation	Chlorination, bleaching powder, Community bathroom with solar based running water facility	Sanitation Services
Drinking Water	Handpump Construction/ Repair, Jalminar- Solar based drinking water system	Health Services
Kitchen Garden	Kitchen garden promotion, training, distribution of seeds	Health Services
PoE		
Educational Institutions Development	Smart Classroom, School Building Renovation, Library set up, Classroom furniture for smart class, Anganwadi Centre BaLa Paintings	Infrastructure in Educational Institutions
Education Enhancement	Adult Literacy Sessions	Education enhancement
Awareness Generation	Sensitization on School Wash (Hand Wash Practices)	Awareness generation

3.2 Programme Implementation

The interventions for community empowerment and rural development are crucial for target villages. The HRDP intervention for NRM, has focused on low land/seepage irrigation well and construction of nine new ponds to enhance the irrigated land area around the structures. Additionally, solar based lift irrigation and installation of drip with mulching has been implemented with joint farmer groups for irrigation. In terms for farm management, System of Rice Intensification (SRI) method was implemented along with horticulture plantation (mango/guava). Cash crops were also promoted in the region such as strawberry cultivation,

watermelon cultivation, yam cultivation and papaya cultivation in select households. To address land ravination--gabion and stone building structures were also established. In terms of clean energy, solar streetlights have been constructed in the project villages.

As livestock is a major source of income for agrarian households, distribution of goats and pigs was implemented along with fishery management training. For adequate fodder for livestock azola production trainings were also implemented. For maintaining animal health, animal husbandry management camps were set up where animals were vaccinated. Additionally, training of Animal Healthcare Workers was set up for interested candidates in the NGO office to create self-reliance amongst people. The project strengthened the role of the Village Development Committee in all project villages which then prepared lists of individuals who could be provided support through such interventions. To provide agriculture training and support, farmers were exposed to research institutions, trainings on organic method/ zero budget farming; also, training of farmers on collective marketing was organised. Farmers and interested village members were also trained in pearl farming and mushroom cultivation. SHG's were given adequate trainings on establishing micro-enterprises such as mushroom farming, tent house planning and financial literacy trainings.

Food insecurity was addressed under 'healthcare and hygiene' theme mainly through promotion of kitchen garden. The seeds of everyday use vegetables were distributed, and training was given on how to grow a kitchen garden to ensure consumption of adequate nutrients by households. There were health sessions and camps conducted in the village for overall health awareness especially for young women; haemoglobin testing camps were also set up. To prevent the spread of diseases, efforts were made to address water-related issues. This included repairing hand pumps, setting up solar-based drinking water systems, and distributing bleaching powder for well chlorination. Solar based common bathing units were also constructed in project villages for women.

Through HRDP, 'promotion of education' was undertaken, where the village schools were renovated with BaLA paintings, provided with a shelf library with 300+ books, and drinking water posts were established in some primary schools, along with repairment of school toilets.

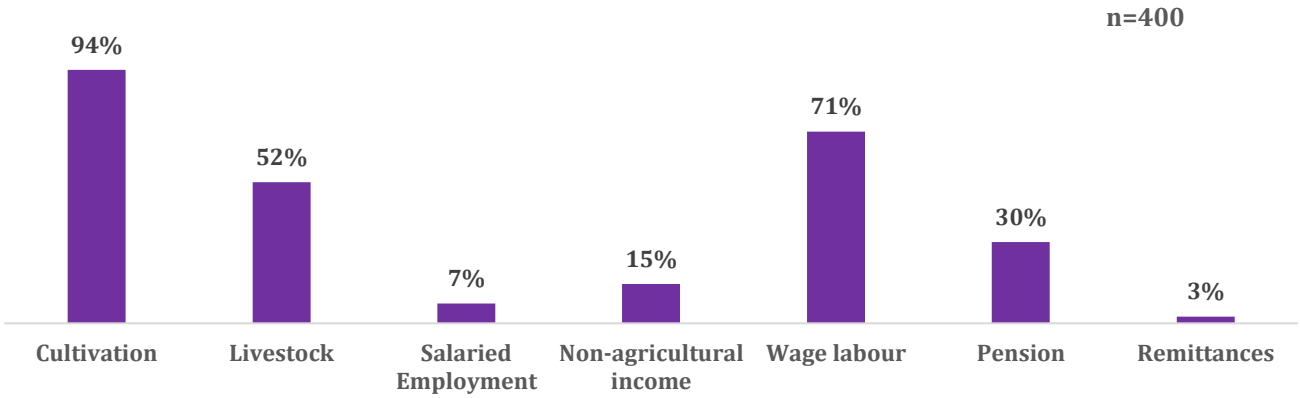
3.3 Monitoring and Evaluation

The impact of KGVK activities 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 based on selected indicators. The impact of each activity has also been calculated and classified as high, medium, or low impact. The annexure goes into greater detail on these. (See Annexure B and C).

4 Study Findings

This section provides the analysis of the profile of the respondents covered in the eight villages of Ramgarh district in Jharkhand. All respondents have more than one source of income. Around 94% of respondents generate income through cultivation, followed by 71% reporting income from wage labour. Meanwhile, 52% respondents depend on livestock for livelihoods.

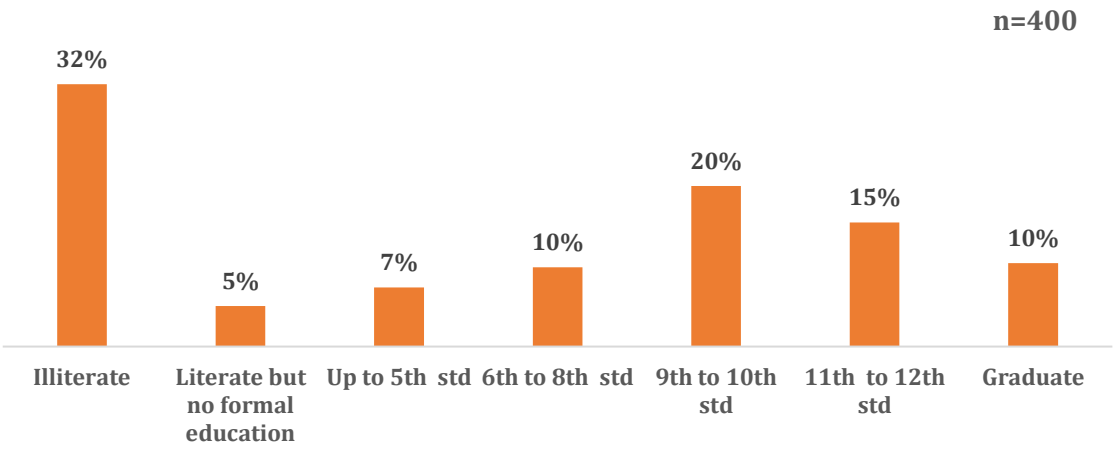
Figure 4: Distribution of Sample based on their occupation



The educational status of the respondents indicates that 32% are illiterate, lacking the ability to read and write. Additionally, 20% completed education up to the 9th to 10th standard, while 15% pursued studies until the 11th to 12th standard. In terms of higher education, 10% of the respondents are graduates. The 2011 census data reveals that Jharkhand's overall literacy rate is 66.41%, a figure mirrored in the Ramgarh district.

Regarding the social category of the interviewees, the majority belong to the Other Backward Classes (OBC) and Scheduled Tribe (ST) categories, comprising 52% and 40%, respectively. Although the 2011 census notes the ST population in Ramgarh district at 21%, the chosen intervention villages predominantly consist of ST and OBC populations, as evident from the sample. Additionally, 7% of the respondents belong to the Scheduled Caste (SC) category. In terms of economic status, 59% possess Below Poverty Line (BPL) cards, while 18% hold Antyodaya cards. Notably, 10% of the respondents do not possess any cards.

Figure 5: Education qualification distribution of sample



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 Table 5)

Table 5: Quantum of Activities under each Activity Category across Four Thematic Areas

Activity Category	Activities	Nos. (as provided by IA)
NRM		
Farm Management	Multi-Tier Cropping System SRI Training Azola Construction of Zero Energy Cool Chamber	118 28 364 23
Irrigation Management	Farm Pond Construction/ Renovation Drip Irrigation with poly mulching Check Dam Desiltation of Pond Gravity based irrigation channel construction Low Land Well Construction	43 108 1 4 3 80
Horticulture/Wadis	Guava Cultivation Papaya Cultivation Mango Cultivation Yam Cultivation	1424 saplings 993 households 2694 saplings 62 households
Clean Energy	Solar Streetlights	108
ST&LE		
Agriculture Training and Services	Training on Vermi Compost Farmer Field School Exposure Visits Training on Organic Methods Zero Budget Training of farmers towards collective marketing Training on Mushroom Cultivation Training on Formation and Application of organic soil fertility	182 farmers 14 farmers 421 farmers 878 farmers 56 farmers 787 farmers 623 farmers
Skill and Entrepreneurship Development	Training on Micro Enterprises development Tent House (SHG) Mushroom Production Unit (SHG) Rice Huller Machine (SHG) Cono Weeder and Paddy Thresher (SHG)	604 members 10 3 18
Livestock Management	Piggery Goatry Fishery Training of Animal Health Worker Animal Health Camps	136 households 28 households 150 farmers (ponds) 82 people 112 camps
H&S		
Health	Health Camps Haemoglobin camps for adolescent girls	3358 people 3619 girls
Sanitation	Chlorination, bleaching powder Community bathroom with solar based running water facility	70 units 6 units
Drinking Water	Handpump Construction/ Repair Jalminar- Solar based drinking water system	168 31
Kitchen Garden	Kitchen Garden promotion	1016 households
PoE		
Educational Institutions Development	Smart Classroom School Building Renovation Library set up Classroom furniture for smart class	7 schools 11 schools 7 schools 7 schools

	Anganwadi Centre BaLa Paintings	18
Education Enhancement	Adult Literacy Sessions	559 Participants
Awareness Generation	Hand Wash Day Celebration	2259 students

(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

NRM stands as a pivotal pillar within the HRDP framework, strategically tailored to address the community's needs and align with the geographical context. The extensive program featured a range of targeted interventions in irrigation management, meticulously designed to establish a reliable alternative irrigation source beyond the constraints of rainfed agriculture. These initiatives were carefully structured to augment water availability and distribution, ensuring a sustainable and resilient irrigation system. The overarching objective was to reduce dependence on unpredictable rainfall patterns, fostering agricultural practices resilient to weather fluctuations. In collaboration with Village Development Committees, the project established 80 lowland well structures, renovated 43 ponds, and constructed one check dam. Additionally, farmer groups received drip irrigation units with poly mulching. The program encompassed various activities, including non-pesticide management training, seed distribution, knowledge dissemination on farming techniques, multi-tier cropping, and gabion construction in project villages. By tackling soil erosion issues and implementing sustainable NRM practices, the initiative aimed to create a more resilient environment, fostering enhanced water retention and efficiency. Moreover, the NRM interventions sought to expand cultivable land, boost local households' agricultural productivity, and contribute to overall food security. The program placed a strong emphasis on knowledge dissemination, empowering the community with insights into cultivating cash crops and adopting modern, sustainable farming methods. This educational aspect aimed to equip farmers with tools and understanding to optimize their agricultural practices, fostering a more economically viable and environmentally sustainable agricultural landscape in the region. (See Annexure B for detailed information on water storage structures built in the project region).

4.1.1 Income from Agriculture

In the survey sample, the benefits from agricultural activities were availed by 93% of the total respondents making it the most important category of interventions under HRDP. A major focus of the program was to introduce SRI farming techniques to farmers, multi-tier cropping system for vegetable farming and the introduction of mushroom and strawberry farming in limited land to increase revenue. Additionally, through irrigation interventions there was an effort to develop double and triple cropping on land.

Figure 6: Increase in agricultural income (INR)

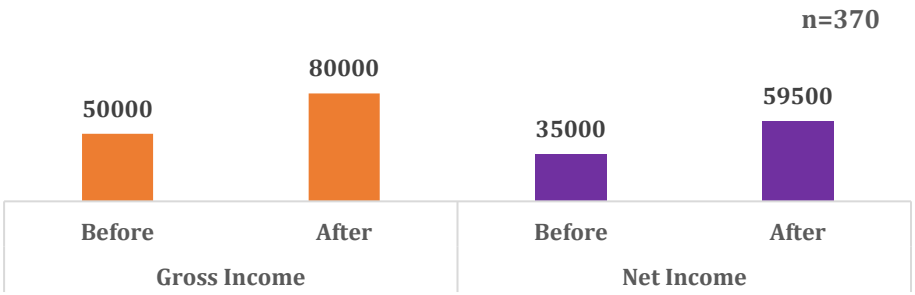
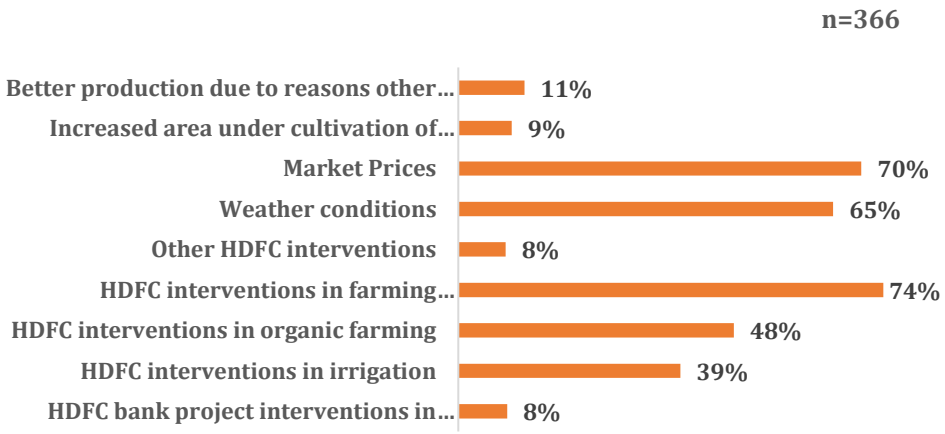


Figure 6 illustrates a comparison between the median gross income and median net income before and after the project intervention. **There is a 60% increase in gross income and a 70% increase in net income.** Despite a 33% rise in input costs, there has been a positive shift in gross and net income trends over baseline. Regarding households reporting a change in income, 99% reported an increase in income. **Upon conducting a two-sample z-test, P-value of less than 0.0001 was found against a z-statistic of 8.6 (at 95% confidence level) indicating that it is a significant change.** Around 94% of the respondents reported an increase in profit post-project interventions. The attributed reasons for this increase include program interventions in farming techniques like SRI (74%), increased market prices for cash crops (strawberry and mushroom) during the project (70%), and favorable weather conditions (65%). Qualitative interviews revealed a significant impact of the program, with the construction of low-land wells and ponds by HDFC, strategically designed to harness rainfall, emerging as a pivotal factor. These storage structures effectively extended irrigation access to nearby fields, augmenting cultivable land and directly boosting income for participants (refer to Figure 7). Respondents also linked HDFC interventions in organic farming (48%) and irrigation (39%) to income growth.

While the program has led to a noticeable income increase for participants, it is crucial to note a simultaneous rise in input costs affecting 83% of respondents. The primary factor contributing to this increase, reported by 87% of respondents, is the escalation in prices of essential inputs. This includes a substantial cost increase in items such as strawberry bushes, highlighting the broader pattern of rising input expenses. The surge in input prices, notably exemplified by costly strawberry bushes, underscores the challenges faced by farmers in maintaining profitability. Despite enhanced income, grappling with higher input costs emphasizes the ongoing need for support and strategies to mitigate the economic impact on the farming community.

Figure 7: HRDP interventions that contributed to increase in income



Respondents have reported an increase in the median production of the major crops grown in the area namely paddy, vegetables, and mushroom. Since mushroom is grown on relatively smaller patch of land in bags, its production figures are indicative of the same. Additionally, since mushroom is a new crop introduced by HDFC bank interventions there is no pre-project data available. Table 6 refers to the increase in agricultural production of the major crops grown in the region.

Table 6: Increase in Agricultural Production After the HDFC Project

Crop Name	Median Production Before (kg/ acre)	Median Production After (kg/ acre)	% Change
Paddy	1500	3000	100%
Vegetables	700	1000	43%
Mushroom	-	60	-

Farmers in the region received guidance on the efficient use of water resources through drip irrigation, known for its precision and water-saving advantages. The program also endorsed mixed cropping techniques, where creeper vegetables and land vegetables were cultivated together on the same plot. This approach optimizes land use, enhances biodiversity, reduces the risk of crop failure, and improves overall soil health. Farmers underwent training and received support to implement these techniques effectively. Paddy interventions primarily focused on the SRI cultivation method, significantly improving production compared to traditional paddy growing methods. Farmers were trained in SRI intricacies, providing them with the knowledge and skills needed for effective implementation. The SRI method emphasizes precise water control, transplanting healthy seedlings, and adopting spacing and weed management techniques to optimize plant growth, contributing to increased yields, resource efficiency, and higher productivity.

HDFC Bank interventions also promoted winter vegetables like beans and peas through organic growth promoters and bio-fertilisers, encouraging a shift towards organic farming techniques. Seedlings of drumstick, tomato, and brinjal were raised and planted in fields; this was collectively managed and sold. The project introduced button mushroom cultivation, providing farmers with 20 bags (1 kg yield per bag). HDFC interventions in organic farming and irrigation have contributed to increased agricultural production.

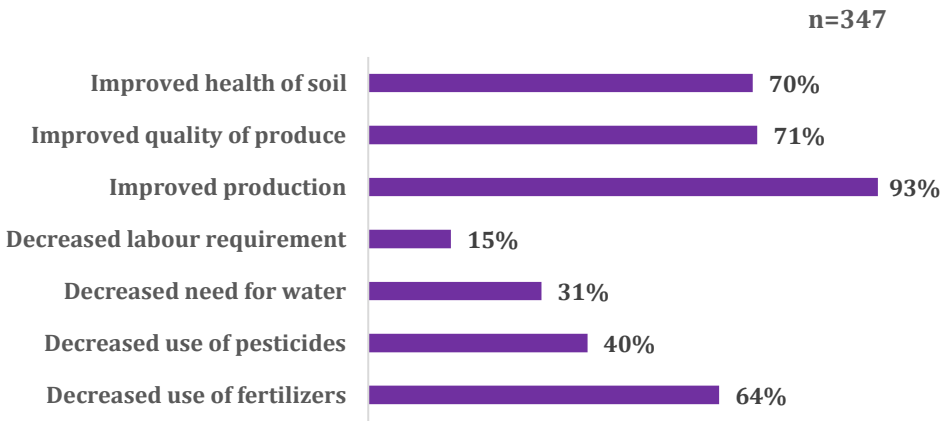
Table 7: HRDP Interventions that led to increase in agriculture production

Project Interventions (% respondents)	Paddy	Vegetables
HDFC bank project interventions in seeds and tools	12%	10%
HDFC interventions in irrigation	37%	44%
HDFC Interventions in organic farming	49%	59%
HDFC interventions in farming techniques (e.g., SRI, creeper farming)	83%	26%
HDFC interventions in agricultural installations (e.g., green nets, farm bunding)	1%	2%
Other HDFC interventions	8%	9%
Weather	60%	57%
Increased area under cultivation of crops	7%	13%
Improved irrigation	87%	92%

Currently, 83% of households report using both natural and chemical fertilisers. 11% of farmers in the region exclusively use natural fertilisers. During the last season of the project's intervention, 90% of respondents reported an increase in the use of natural fertilisers, and 50% reported a

decrease in the use of chemical fertilisers. 56% of respondents use vermi pits as a source of natural fertiliser, mainly due to the promotion of natural fertilisers through training and demonstrations during the project period. The increased use of natural fertilisers has led to benefits such as improved production (93%), improved quality of produce (71%), and improved soil health (70%), among other benefits (refer to Figure 8). More than 85% of farmers are fully satisfied with the information provided on natural fertilisers.

Figure 8: Perceived benefits of natural fertilisers



4.1.2 Adoption of horticulture and crop diversification

From the sample survey, 60% of respondents have altered the crops they previously cultivated, with 64% attributing these changes to HDFC project interventions. The cultivation of mushrooms is practiced by 70% of respondents, followed by other vegetables and strawberries (20%). Additionally, 10% of respondents have started growing drumsticks and watermelons in their fields. A smaller group has also adopted paddy and wheat on their reclaimed land, a result of the implemented soil intervention techniques. 58% of farmers have reported an increase in productivity, while 41% of respondents reported an increase in income.

The program team undertook significant efforts to diversify agricultural activities in the project area by introducing crops and horticultural products known for their ability to yield higher income, especially in small land patches. Strawberry cultivation has proven highly successful in the region, with many farmers adopting the practice after observing trained farmers. The success of strawberry cultivation not only contributes to increased incomes for individual farmers but also serves as a model for introducing and promoting high-value crops in small land patches, enhancing the overall economic resilience and sustainability of agriculture in the region. The initiative involved training farmers in specialized techniques required for successful strawberry cultivation, including soil preparation, planting methods, irrigation strategies, and pest control.

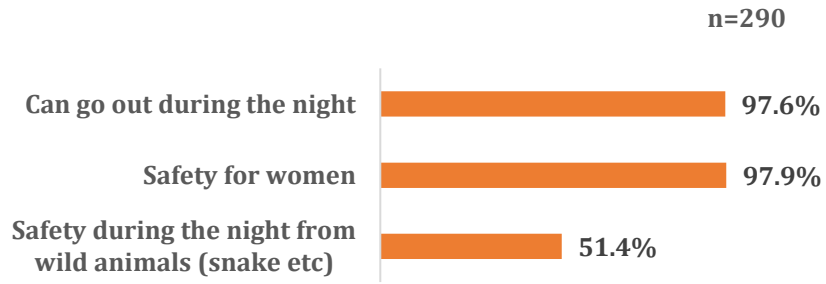
31% of farmers have also started cultivating horticultural fruits such as papaya, guava, and mango in the region (85%, 25%, 23% respectively). While papaya fruit is grown in intermediate seasons depending on household budgets and constraints, mango wadis are yet to bear fruit, but farmers are patient, acknowledging its potential in the coming harvest season. **In the last production year, the mean income generated per household from horticultural plants that were planted with support from the HDFC Bank project was INR 8,573. Patratu block has the highest income generated (INR 14,848) in the previous year. 73% of respondents note an**

increase in nutrition, and 43% mention additional income as the primary benefits of the intervention.

4.1.3 Clean Energy

To ensure the project villages area properly accessible to everyone at night, 108 solar streetlights were installed through HDFC Bank interventions. From the sample, 88% of the respondents mention that the streetlight is near their house indicating the wide-reaching access of the light. These solar lights have greatly benefitted the people as women and children can move more freely at night. The light also helps look out for wild animals in the area. The solar lights are set up on key roads of the village, making the main alleyways light up at night. Additionally, 86% of the respondents note that the solar streetlights in the area are functional. Streetlights are jointly managed by the village coordinator and residents of houses near the adjoining streetlight.

Figure 9: Perceived benefits of solar streetlights

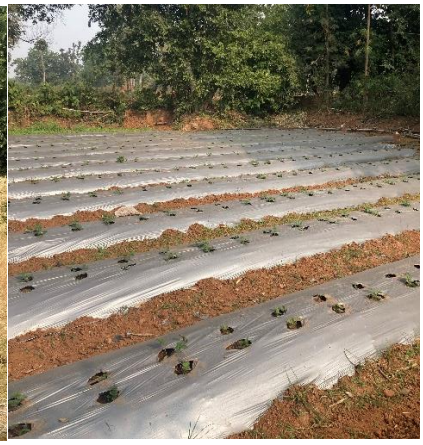


Mushroom Farming

Solar Irrigation structure

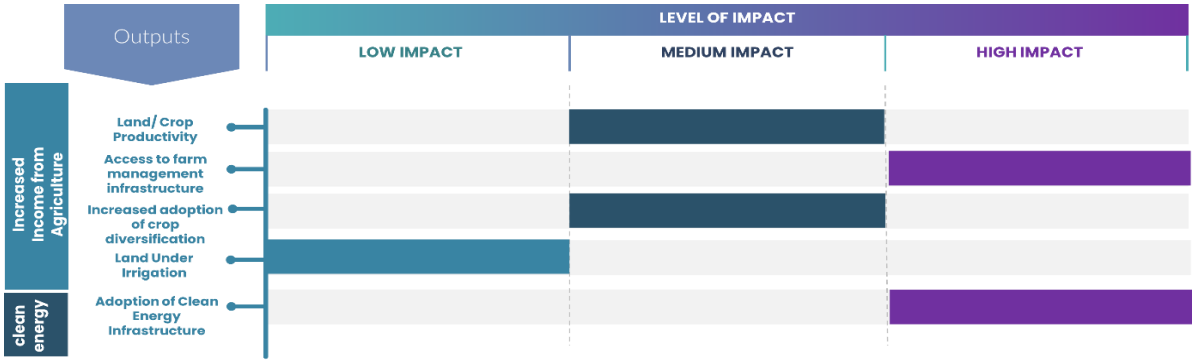
Pond Structure

Strawberry Cultivation



4.1.4 Impact Observations

Figure 10: Overview of Impact and Effectiveness of Interventions - NRM



In the domain of natural resource management, interventions aimed at enhancing land productivity have demonstrated a moderate impact across the area. This is predominantly attributed to the increase of input costs associated with cultivating cash crops like strawberries. The project villages currently face challenges in acquiring timely supplies of high-quality, disease-free strawberry planting material or runners from local suppliers, resulting in delayed production. However, interventions in farm management have proven highly effective, with the majority of farmers adopting natural fertilizers. The dissemination of knowledge and practices among farmers has created a learning space through project interventions, involving even those who were initially not engaged. Notably, interventions targeting assured irrigation have encouraged many farmers to adopt double cropping, thereby increasing their income. The collaborative management of solar and drip irrigation systems by local farmers has contributed to this success. Additionally, the installation of solar streetlights has had a significant impact, providing a safe pathway for people during the night.

4.1.5 Case Study

Strawberry Cultivation by Bishashwar Mahto

Mr. Bishashwar Mahto, a marginal farmer from Burhakhukra village, Ramgarh district, has emerged as a progressive farmer, breaking away from traditional cultivation practices. Traditionally cultivating crops like tomatoes, peas, beans, brinjal, and other vegetables, Mr. Mahto's farming journey took a transformative turn when he underwent basic training in farming techniques, watershed activities, and livestock management through HDFC's HRDP project. Empowered with knowledge and support, he ventured into strawberry farming in a pilot mode on a 10-decimal plot during the 2019-20 season. The pilot phase proved successful, with Mr. Mahto earning approximately Rs. 50,000. Encouraged by the positive outcome, he expanded his strawberry cultivation to a 20-decimal plot in the 2020-21 season,

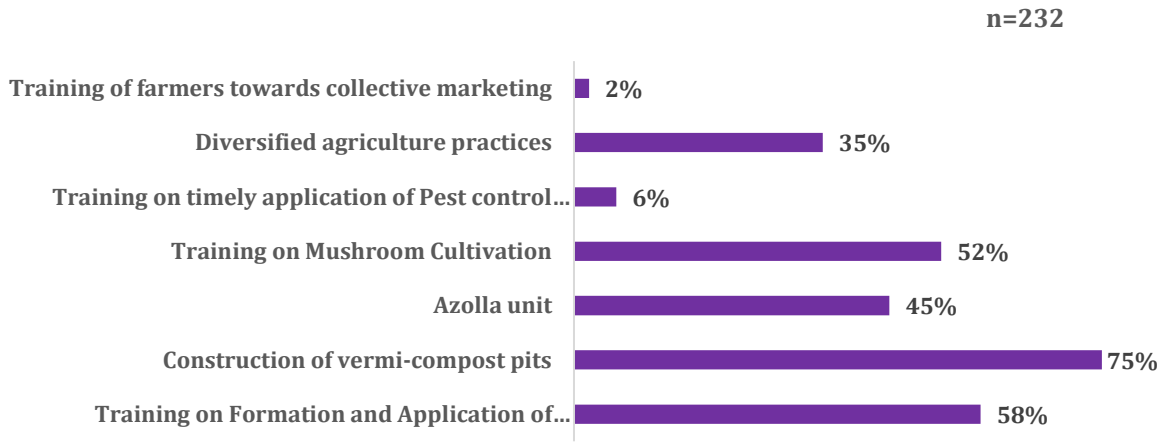
resulting in an income of Rs. 1,69,500. He has currently sown the seeds for the upcoming season. Since presently there is a delay in getting adequate seeds, he is hoping by the end of December his investments will prove to be successful once again. The transition to strawberry farming yielded a remarkable return for Mr. Mahto. Motivated by the success, Mr. Mahto invested in a drip irrigation system for his one-acre plot. He has also constructed a poultry shed to further diversify income streams. With increased financial stability, Mr. Mahto aspires to enrol his younger son, Gokul Kumar, in a private school, shifting from a government school to focus more on his education. His nearby farming neighbour has also been motivated by Mr. Mahto's success and has planted strawberry bushes for the upcoming cycle.

4.2 Skill Training and Livelihood Enhancement

4.2.1 Access to Agriculture Training and Services

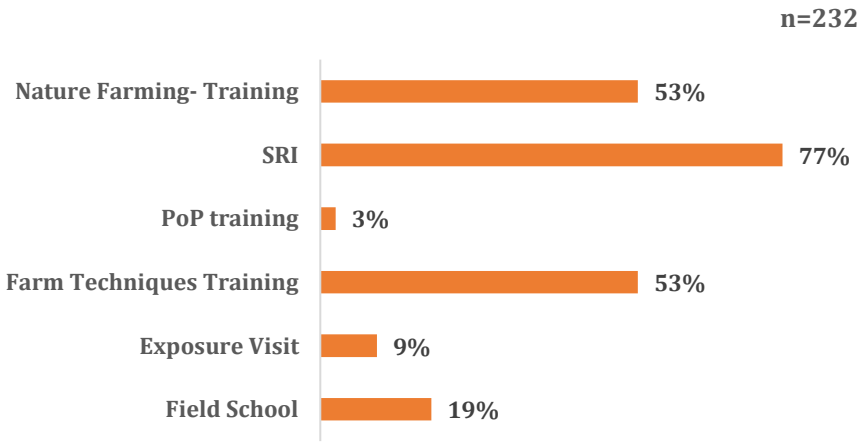
From the surveyed households, 58% people have benefitted from the intervention on agricultural training and support. From the households who benefitted, all households have received support in terms of agricultural training practices.

Figure 11: Percentage of farmers who learnt new agricultural practices



As seen in Figure 11, through HDFC interventions, 75% of households have received training in constructing vermi-compost pits, while 58% have been trained in the formation and application of organic soil fertility. Mushroom cultivation training was provided to 52% of households, and 45% received training on azolla units for livestock. These interventions have significantly contributed to enhancing farmers' income by focusing on developing skills in both farm-based and off-farm-based income generation and livelihood initiatives. Currently, 50% of farmers routinely construct vermi-compost pits and work on organic soil fertility in their fields, with 99% learning these practices through HDFC Bank interventions.

Figure 12: Percentage of farmers who received agriculture training on new techniques



In terms of various training received by farmers, 77% received SRI training, and 53% received nature farming and farming techniques training (Figure 12). Notably, 97% of respondents found the training useful. The primary benefits reported by 90% of respondents include an increase in income and productivity resulting from agricultural training received through HDFC Bank interventions. Improvements in soil health through organic farming methods were noted by 58% of respondents (Ref. Fig. 13). Figure 14 outlines the perceived improvements in farming after adopting the agricultural trainings. Specifically, 84% of respondents highlighted the improved capacity to increase productivity as the primary benefit of farmer training, followed by 57% mentioning improved awareness. Additionally, 46% of respondents noted a reduction in input costs as a benefit of the training. Since farmers in the region previously relied on traditional farming knowledge, these interventions have proven invaluable in increasing yields and exposing the entire community to advancements in farming techniques through exposure visits.

Figure 13: Perceived Benefits of agriculture practices

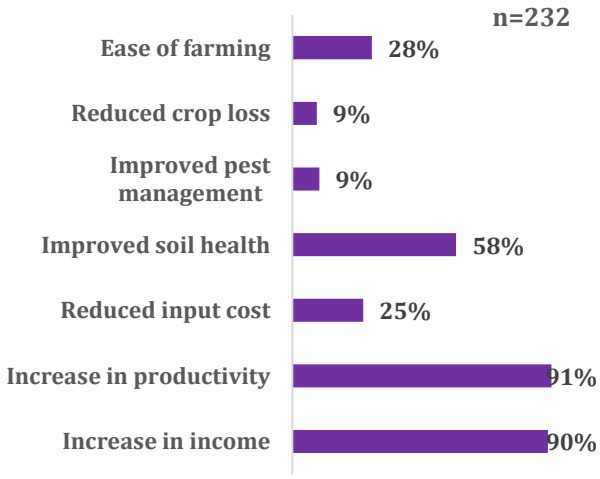
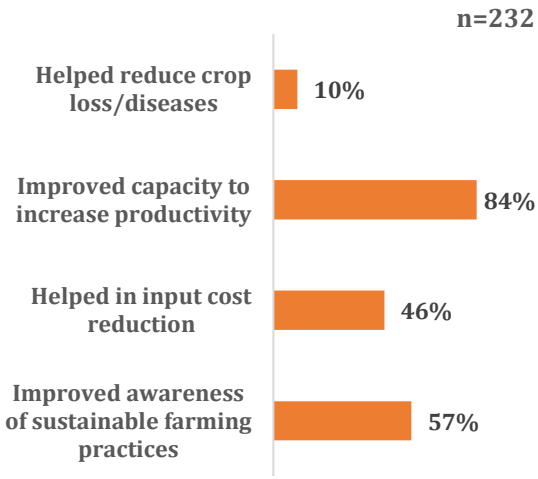


Figure 14: Perceived Benefits of agriculture trainings

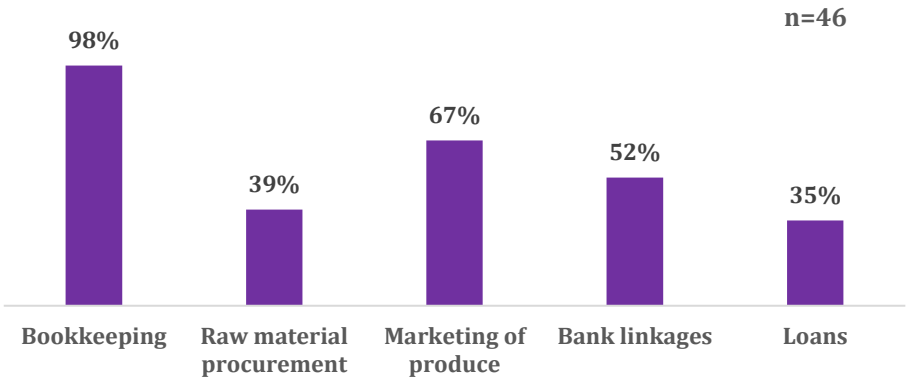


4.2.2 Economic Empowerment through Collectivisation

Eighteen percent of respondents have reported benefiting from SHG development. While SHGs were already established in the area, primarily engaged in internal moneylending, HDFC interventions facilitated the establishment of micro-enterprises with 18 SHGs and 14 adolescent girls' groups (Kishori *Samuh*). The interventions included training on leadership, entrepreneurship awareness, digital literacy, and financial inclusion. The qualitative study reveals that the main support provided to existing SHGs involved strengthening them through entrepreneurship opportunities, such as distributing tools like tent houses, rice huller machines, cono weeders, and paddy threshers for an agri tool bank in collaboration with farmers in the village. Entrepreneurship opportunities were identified based on consultations with the SHGs. Through the project, 63% of SHGs mention establishing or expanding enterprise/business activities, and 55% of women mention establishing linkages with banks as the primary intervention in the region. Currently, 92% of the SHGs are functional.

The main training received, as reported by women SHG members, is depicted in Figure 15. Ninety-eight percent of respondents mention bookkeeping of enterprise activities, followed by marketing of produce (67%) and bank linkages (52%) as the main activities for expanding business activities of the SHGs in the region.

Figure 15: HDFC Interventions for expanding enterprise/business activity of SHG



In addition, women exhibit considerable knowledge of the processes and systems required to maintain their SHGs. They reported that this has boosted their confidence, and loans distributed through the SHGs and bank linkages have been beneficial for constructing houses, conducting marriages, and internal household purposes. Regarding enterprises, many SHGs have sporadically started mushroom cultivation and packaging during the winter season. Bangle-making trainings have also been imparted, and women express interest in gaining additional skill-based training to set up their own enterprises in the future. The mean monthly income from SHGs in the region is INR 2,039.

4.2.3 Improved Capacity to Generate Income Through Livestock Management

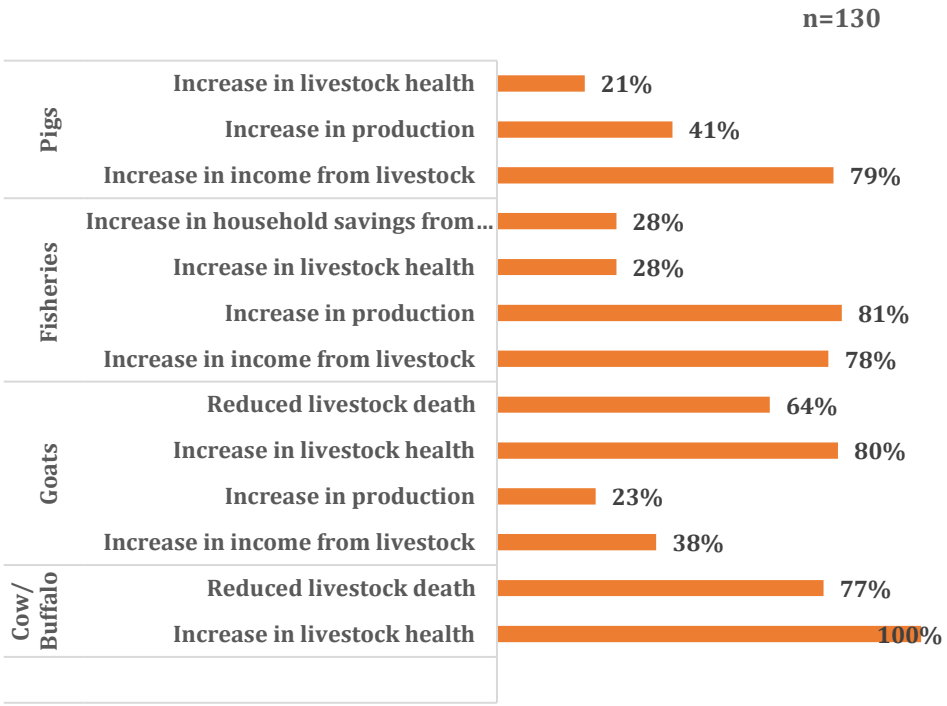
Around twenty-eight percent of respondents have benefited from interventions in livestock management. The primary intervention provided to beneficiaries includes the distribution of goats and pigs for rearing, accompanied by training and the management of fisheries in newly developed ponds through HDFC project implementation. Specifically, the T&D variety of pigs was promoted, with each household receiving support in the form of two female and one male piglet

at a reduced price, benefiting 136 households. For goat rearing, 28 households were provided with 5 goats each—one male and four females. Additionally, 150 farmers received support in fisheries, with the distribution of Rohu, Katla, and Mrigal breeds of fishes, along with training in proper management. Routine health camps were set up for livestock, involving the vaccination of animals, and 82 participants were trained as animal health workers in the village for effective vaccination and checkups of animals. The azolla unit created in households has provided nutritious food, effectively aiding the overall health of livestock.

Figure 16 outlines the perceived benefits of livestock interventions in the region. Concerning piggery, 79% of beneficiaries note an increase in income in their households. Qualitative interviews revealed that some beneficiaries were able to earn Rs. 60,000 per pig sold. Around 81% of respondents observed a rise in production of fisheries, while 71% noted an increase in livestock production. For goats, cows, and buffaloes, the primary benefit has been through access to health camps, which has helped maintain livestock health in the region.

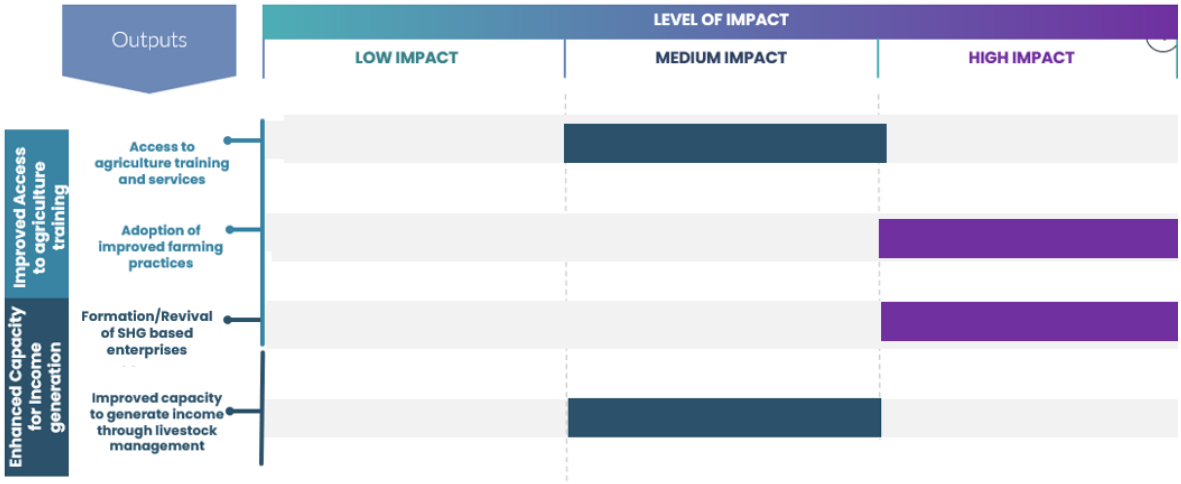
On an average 20% of the income generated by households is through livestock management. **Thus, the intervention has been beneficial in securing 20% of the household income.** The median monthly income from livestock is Rs. 8,945 marking a 142% increase from the income before the project.

Figure 16: Perceived benefits of livestock interventions



4.2.4 Impact Observations

Figure 17: Overview of Impact and Effectiveness of Interventions -ST&LE



Under ST&LE, a considerable number of farmers have adopted the practice of using natural fertilisers to some extent which is indicative of the high impact. Moreover, SHG women have greatly benefited from enterprise support and trainings on record-keeping and the regular conducting of routine SHG activities, which they have continued to apply with the support of the project interventions as observed with the high impact. Livestock management services have helped create awareness regarding livestock diseases and through a cohesive practice of training animal health workers, made resources for vaccination available to the villages thereby increasing livestock health and income.

4.2.5 Case Study

Animal Health Worker Success story

Mr. Pradeep Mahto, a farmer from Goratu village in Ramgarh district, underwent a transformative journey in animal healthcare through the HDFC program intervention. Traditionally engaged in farming, Mr. Mahto recognized the potential for extended income sources and a deeper understanding of livestock care. This realization prompted him to enrol in a comprehensive 3-month animal health training program at the KGVK head office, focusing on the health management of pigs, goats, and cows. Equipped with knowledge gained during the training, Mr. Mahto became adept at securing livestock health, particularly in a region plagued by various livestock ailments. His expertise extended to disease prevention through vaccinations, a concept unfamiliar to many households in the area. The HDFC program organized animal health camps, raising awareness about livestock diseases and preventive measures. Mr. Mahto, armed with his newfound knowledge, played a pivotal role in educating people.

He initiated the process by vaccinating his own cattle and subsequently extended his services to other community members in Goratu village. Recognizing Mr. Mahto's commitment, the KGVK office provided him with an Animal Health Worker Kit. The kit included basic medicines and vaccinations, empowering him to effectively manage the health of livestock in the region. Mr. Mahto's dedication and expertise in animal healthcare have made a significant impact on the community. He has become a key figure in the region, traveling from village to village, vaccinating animals and imparting valuable knowledge on disease prevention. His services have gained popularity to the extent that he humorously claims to "book appointments" for his livestock vaccination services. Mr. Mahto's efforts have not only contributed to the well-being of livestock but have also translated into tangible economic benefits. His monthly income as an animal healthcare worker now stands at Rs. 30,000, showcasing the potential for alternate sources of income than agriculture in the region.

4.3 Health and Sanitation

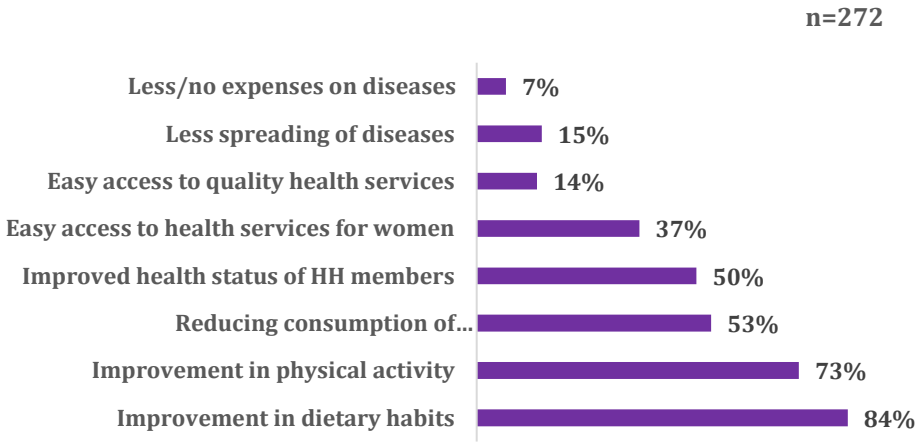
4.3.1 Health Infrastructure and Services

The program included a health awareness component for the people, featuring health camps that were attended by 68% of the total sample. Of these beneficiaries, 94% participated in hygiene-related health sessions, and 71% attended health awareness sessions in the form of annual health camps set up throughout the project's duration. Routine hemoglobin health checkups were organized for adolescent girls, including regular hemoglobin mapping to prevent anemia. The girls were provided with iron supplements and referred to nutritious local diets to help improve their hemoglobin count.

Among the health camp attendees, 94% received diagnoses, and 52% received medication, with 18% being referred to specialists. Of those referred, 85% went for the consultations, highlighting the active involvement of the Community Resource Person (CRP) who facilitated follow-ups and assisted people in traveling to nearby hospitals for treatment.

Figure 18 outlines the perceived benefits of health camps/clinics according to respondents. A substantial 84% stated an improvement in dietary habits as the prime benefit, with 73% mentioning improved physical activity and 53% noting a reduction in the consumption of alcohol and tobacco in the region. Additionally, 50% of respondents highlighted an improvement in health status through HDFC interventions. This suggests that the benefits have contributed to awareness generation and facilitated access to healthcare, especially for women, through routine follow-up activities conducted throughout the project. Qualitative interviews further indicated that most adolescent girls have become conscious of their eating habits, routinely taking care of their diet and displaying significant awareness regarding the importance of treating anemia.

Figure 18: Perceived benefits of HDFC Bank supported health camps



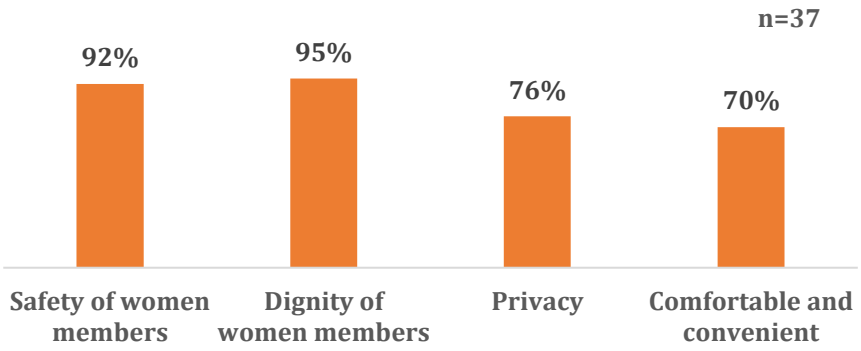
4.3.2 Sanitation

The sanitation interventions implemented in the project area addressed two critical challenges prevalent in the region. Firstly, the initiative targeted the proliferation of waterborne diseases associated with stagnant water. By introducing measures to improve water sanitation and promote proper waste disposal, the program sought to mitigate the health risks posed by standing water. Secondly, the project addressed the safety concerns of women members in the community, particularly those who bathe in common areas of the village. Sanitation facilities were strategically designed and implemented to enhance privacy and security for women accessing

communal bathing areas. This dual-pronged approach not only aimed at improving public health outcomes but also prioritized the well-being and safety of vulnerable community members, contributing to a more inclusive and hygienic living environment. For this, HDFC interventions trained and distributed 70 units of chlorine and bleaching powder for village sanitation to household members near water bodies and constructed 6 community bathrooms with solar based running water facility in project villages. These benefits were availed by 64% of the total sample beneficiaries. With regards to chlorination and bleaching powder distributed, the people note that it has helped in disinfecting water bodies in the village that can cause many waterborne diseases such as cholera, dysentery, and typhoid. The proactive use of these sanitation materials has not only contributed to improved water quality but has also generated heightened awareness among community members regarding the importance of water hygiene and safety practices.

Earlier 84% of the women used to bath in the open in the villages; this made them vulnerable to safety concerns. Through the construction of common bathing facilities with 3 separate bathing units, 66% of the women use the community bathroom that is powered by solar energy. Women groups from nearby households maintain the bathrooms, collecting Rs 5 weekly for necessary repairs and maintenance. Figure 19 notes the benefits of community bathing units. As is evident, 95% of the respondents note the dignity of women to be a main benefit of such enclosed structures followed by 92% mentioning safety of women. The project intervention has aided in improving the quality of life of women members in the project villages through dignified structures safe from external threats.

Figure 19: Perceived benefits of Community bathing units



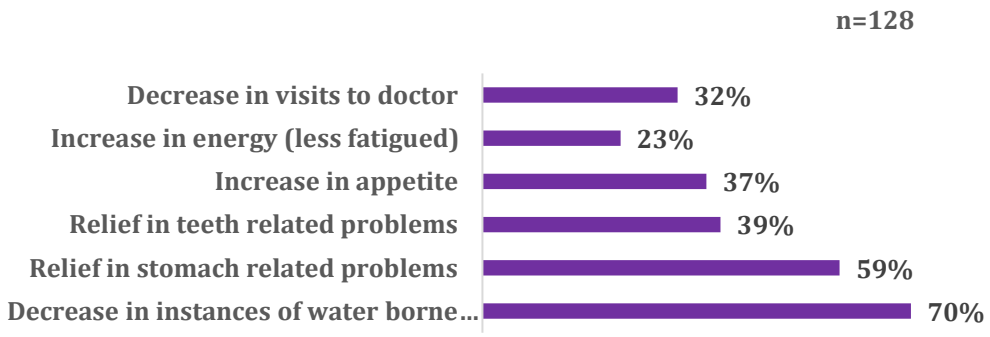
4.3.3 Drinking Water

HDFC interventions focused on repairing household handpumps and providing common drinking water structures in common areas for safe and adequate drinking water facilities in the villages. Of the total sample, 36% households have availed drinking water facilities through HDFC interventions. Out of these, 27% of the drinking water benefits benefitted from handpump installation/ repair in their households. This activity was proven to be unsuccessful in the region as there is a lot of manual power required to pump water; so, this was discarded as an activity in the subsequent project years. A total of 91% of the drinking water beneficiaries benefitted from Jalminar-Solar based drinking water system. A total of 31 Jalminar units were established in common points of the villages with solar based drinking water services that have been highly successful and functional in project villages.

A notable observation is that 89% of recipients of drinking water acknowledge changes in the water source. Previously, the predominant water source was dug well (43%). Women in project

villages noted that the dug well water was sometimes contaminated and caused lots of ailments in the family, especially among children. They also sometimes fetched water from ponds walking about 800 metres to get drinking water for their households. Through the Jalminar drinking water system that is being successfully availed for more than 2 years, the following benefits have been noted by respondents (Figure 20):

Figure 20: Perceived benefits of drinking water interventions



From Figure 20, it is evident that the drinking water interventions have been beneficial in decreasing the instances of water borne diseases (70%), provided relief in stomach related problems (59%) and teeth related problems (39%). Upon asking the women, they mentioned that drinking water interventions have helped in saving time (98%), reduced physical strain and fatigue (88%), and saved additional effort (73%) that was earlier caused by hard labour to collect drinking water in the project area.

4.3.4 Kitchen Garden

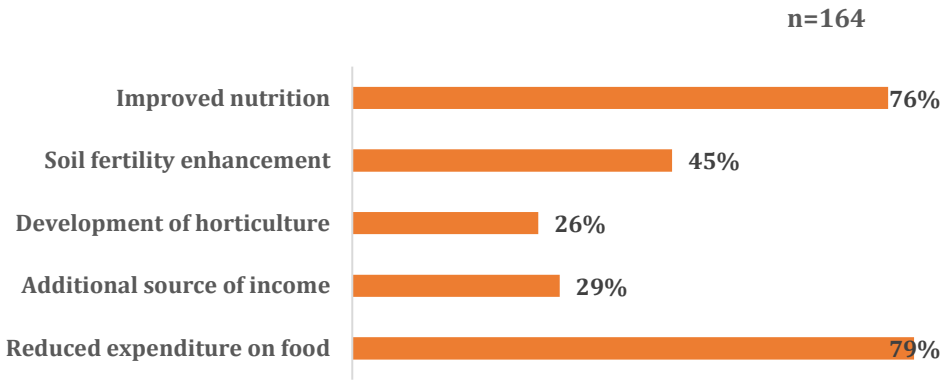
To improve the nutritional status of the community and tackle the problem of malnutrition, especially in ultra-poor households, the project supported the community with kitchen gardens. Out of the total sample, 41% received interventions in kitchen garden out of which 89% of the households' received seeds, 65% households received training on proper management and maintenance, and 5% were shown demonstrations for proper kitchen garden under the intervention. They received support for a variety of vegetables often mixed seeds for vegetables were distributed such as tomato, pumpkin, beans, spinach, radish, lady finger, coriander, coriander etc.

Majority of the respondents were found using the produce from their gardens for self-consumption (77%), and 16% of the respondents do both, sell and consume their kitchen garden produce. The ones involved in selling the produce reported a median monthly income of INR 1200.

While 64% of the beneficiaries observed a decrease in the amount they spent on fruits/vegetables from the market, 84% of the beneficiaries observed an increase in the quantity of consumption of fruits/vegetables from the kitchen garden since the project started. The data shows that a median monthly amount of INR 1000 is reported to have been saved by the households due to kitchen garden.

Moreover, the community is even aware of the benefits of having a kitchen garden as can be inferred from Figure 21.

Figure 21: Benefits of kitchen garden as reported by beneficiaries



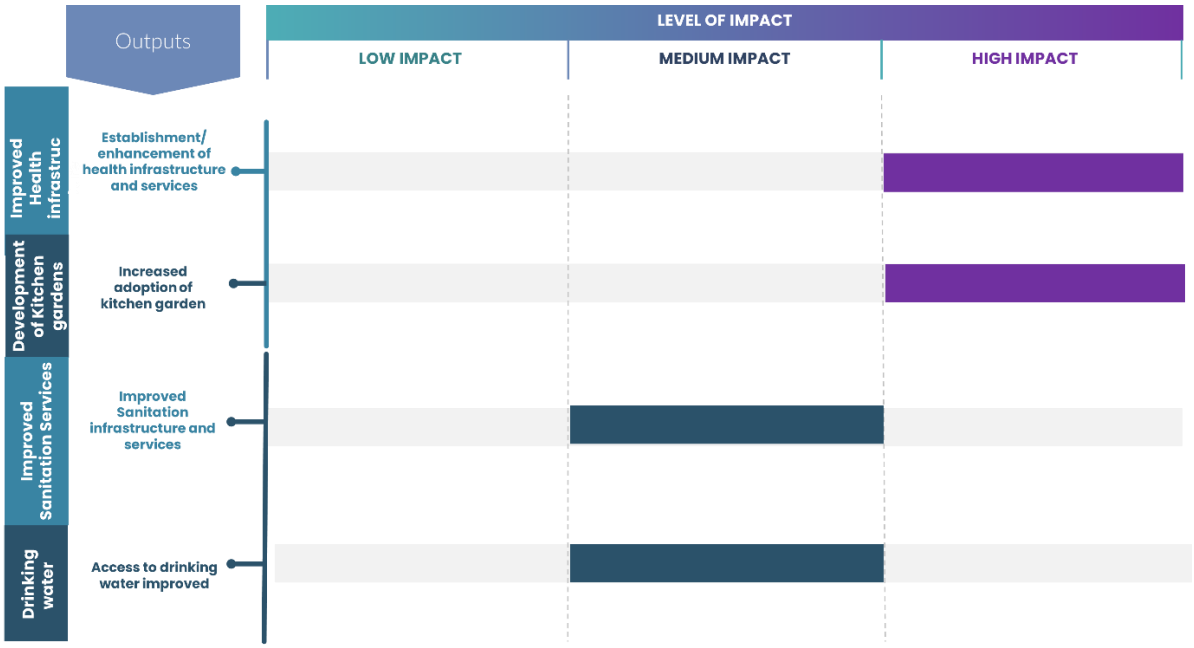
The chart shows that 79% of the respondents note the reduced expenditure on food and improved nutrition in the household (76%) to be the primary benefits of the kitchen garden intervention. This is followed by 45% of the respondents noting soil fertility enhancement to be the benefit of the intervention. 94% of the respondents have said they are fully satisfied with the intervention. The kitchen garden is also undertaken by Kishori Samuh in some project villages and has correspondingly aided young women to take care of their diet and eat hygienic organic healthy food for proper nutrition.

Kitchen Garden Intervention

Solar Powered Bathing Units

4.3.5 Impact Observations

Figure 22: Overview of Impact and Effectiveness of Interventions -H&S



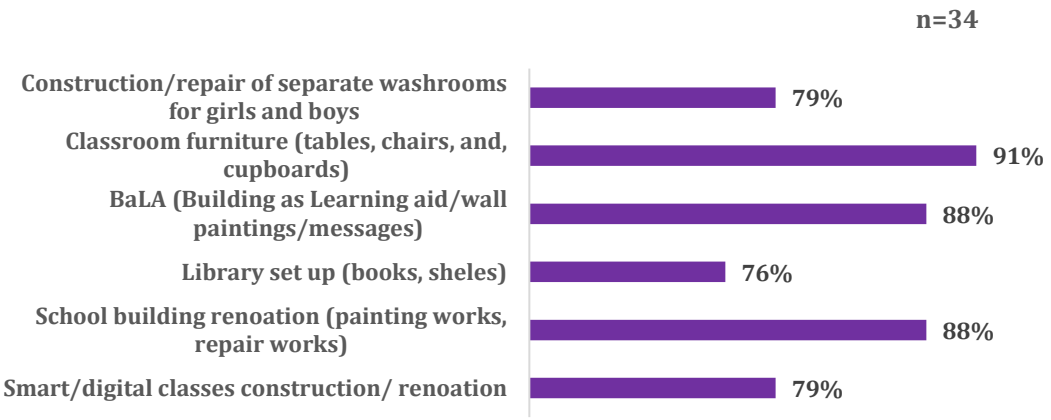
Under H&S, high impact was observed under development of kitchen garden and increased health services in the region. Through routine health camps and trainings on kitchen garden, beneficiaries note the change in their health and increased awareness regarding healthy practices. The introduction of kitchen garden interventions has proven instrumental in providing nutritious food to households and in gaining widespread adoption among families in the project area. Common bathing units have been instrumental in providing dignity to women but there is scope to have more of these structures throughout the villages and the distance between the hilly village terrain necessitates more such infrastructure at common areas. Additionally, the Jalminar drinking water system has been highly effective in curbing water borne diseases but as with sanitation units, there is a need for more such structures in the project area.

4.4 Promotion of Education

4.4.1 Infrastructure in Educational Institutions

A combination of multiple activities targeted towards improving enrolment, attendance, and learning outcomes were undertaken in the project area. The main aim for education interventions is to foster conducive educational environment in government schools that often lack the adequate resources for children to harness learning comfortably. For the same, the project focused on equipping schools with infrastructure facilities. A total of 7 project schools have received smart classroom with smart TV and updated room infrastructure, 11 schools underwent renovation including toilet renovation and 18 Anganwadis in the area had BaLa paintings and furniture distributed through project interventions. Figure 23 reports the percentage of teachers who reported different interventions under education in their school.

Figure 23: Percentage of teachers who reported different interventions under education in their school



All the teachers note that they did not have access to digital classrooms before project interventions. The interventions involved upgrading classrooms with internet access, multimedia devices (speakers and screens), batteries, tables, and benches. This initiative has educated students on maintaining decorum while using the screens. The inclusion of smart classrooms has made students excited about coming to class as noted by Mr. Shayam Kishore Mahto, the principal of high school in Gadke village. 70% of the teachers mention that they use smart class every day. The smart classes make it easier to retain attention of students, keep lessons interesting and aid in explaining concepts better. The teachers in project villages note that the introduction of smart classes has made students progressively better in certain key subjects and stress the importance of pictorial memory for education.

To engage young children in reading and writing, a library shelf along with 300+ books was given to 7 schools in the project villages. This has greatly benefited young students as the difficulty level of the books are matched to the children's ability and make for varied types of readings. The library set-up and the rotatory distribution of books is still active in schools. 73% of the teachers interviewed have stated that they use the library every day, mostly for reference. All teachers have noted that the library makes it easier for students to understand concepts. 90% of the students note that the library set up has aided in providing readily available reference material for exam preparation and for reading material beyond syllabus.

BaLA paintings were also constructed around the school campus and Anganwadi centers. Figure 24 shows the benefits of BaLA paintings according to teachers. From the figure it is evident that BaLA paintings have been beneficial for teachers to keep their lessons interesting for the students and has improved their ability to pay attention (93% respectively).

Figure 24: Perceived benefits of BaLa painting according to teachers

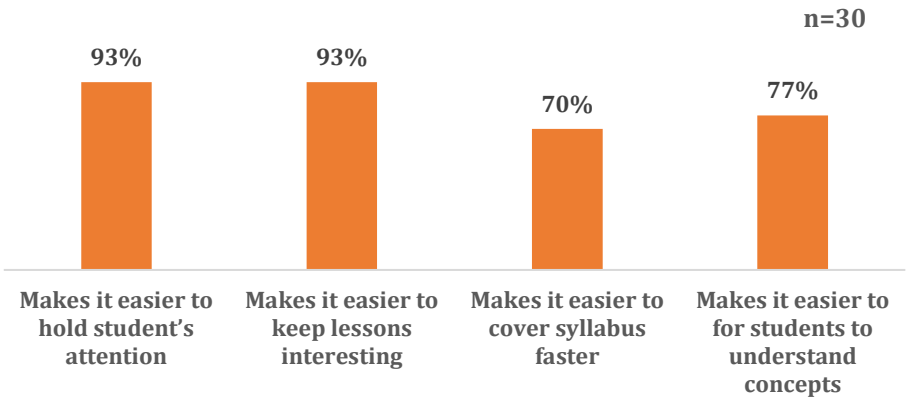
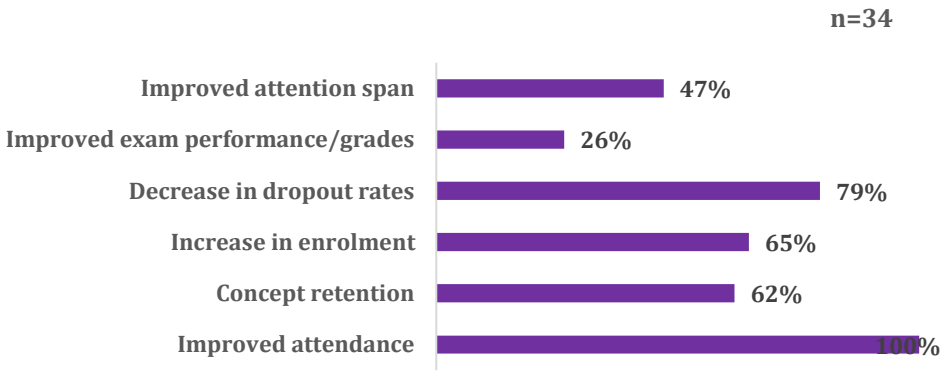


Figure 25 indicates the perceived benefits of infrastructural interventions according to teachers. As evident from the figure, 100% teachers note the improvement in attendance since the interventions. 79% mention decrease in dropout rates through interventions while 65% note the increase in enrolment in government schools as opposed to nearby private schools. 62% teachers also note the increase in concept retention abilities of the students.

Figure 25: Perceived benefits of infrastructure interventions according to teachers



Awareness generation on clean hand wash practice was also organized in project villages. The awareness generation activities, encompassing proper handwashing techniques, serve as an essential component of promoting hygiene among students. By instilling these practices early on, the intervention contributes to the overall well-being of students, fostering a healthier and more hygienic learning environment. This initiative not only aligns with public health goals but also complements the educational system's efforts in promoting essential life skills and hygiene practices among the students.

While education infrastructure in the form of BaLA, libraries etc., are crucial elements of the learning environment and are known to improve student outcomes, facilitate better instruction and reduce dropout rates, there is a strategic and holistic approach that can help in focusing on social-emotional learning, student's academic progress and one which is data-driven and centered on measuring student's learning outcomes and overall quality of education. While the project was successful in creating a conducive learning environment in the schools, more needs to be done to engage with the community. The project needs to create greater awareness among the School Management Committee (SMC) members on the RTE (Right to Education Act) as well as their roles and responsibilities towards school development.

BaLA painting and Smart T.V in class

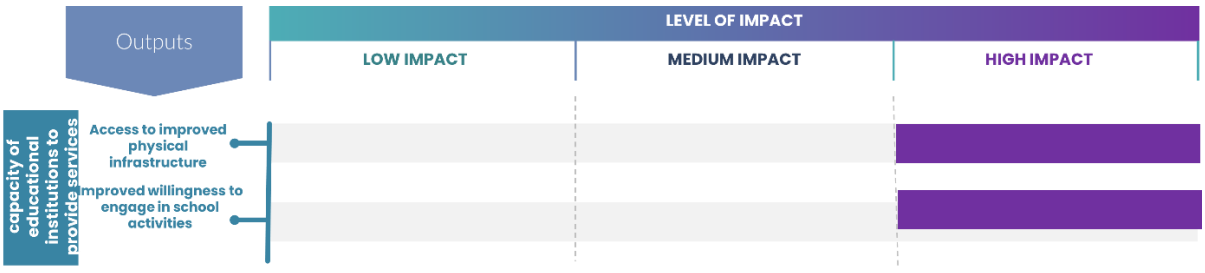
4.4.2 Case Study

Adult Literacy Camps through HDFC Interventions

In response to the educational needs of adults who missed formal opportunities, HDFC interventions initiated an adult literacy program in project villages. Recognizing the potential of senior secondary students as educators, the program enlisted their support, providing a monthly stipend of Rs.1000 to those who taught adults after school hours, 6 days a week for two hours. KGVK facilitated this initiative, offering comprehensive training to the student volunteers to ensure effective literacy classes. The three-month program focused on basic alphabet knowledge and the ability to sign one's own name, addressing practical skills crucial for daily life and emphasizing the restoration of dignity for adult learners. 300 participants are now more confident in signing their name and are eager to learn more. One of the respondents mentioned how she now takes classes with her daughter to start reading as she wants to read different kinds of stories. Beyond academic knowledge, the initiative stands as a testament to the transformative power of education, fostering a sense of empowerment and pride within the community while promoting inclusivity in learning.

4.4.3 Impact Observations

Figure 26: Overview of Impact and Effectiveness of Interventions -PoE



Under PoE, high impact can be noticed for the access to improved physical infrastructure, quality of teaching and children's willingness to engage in school activities. These positive outcomes can be attributed to the sustained interventions implemented, which have catalysed widespread transformations in the project schools. The comprehensive efforts have not only elevated the physical infrastructure standards but have also fostered an enriched learning environment, thereby positively influencing the overall educational experience for the students.

4.5 Holistic Rural Development Index (HRDI)

There are multiple dimensions involved in achieving the goals of HRDP that includes agricultural production, generates new jobs, enhances health, increases communication, and provides better living infrastructure.

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 varies across projects and geographies, it was not possible to ascribe 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 blending of 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 upon the variations in the interventions made in each project, the HRDI customized 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 P0249 implemented in Ramgarh has been given in the following table.

Table 8: HRDI Calculation for P0249, Ramgarh

Domain	NRM		ST&LE		H&S		PoE		Total	
HRDI Score	Baseline	Endline	Baseline	Endline	Baseline	Endline	Baseline	Endline	Baseline	Endline
	0.10	**0.14**	**0.12**	**0.24**	**0.11**	**0.23**	**0.15**	**0.20**	**0.48**	**0.82**
% Change	40%		100%		109%		33%		71%	

While the overall HRDI has 71% increase over baseline, the impact observed to be high in Health and Sanitation (109%) due to streamlined interventions that were new to the region, Skill and Livelihood at 100%, 40% for Natural Resource Management and 33% increase in Promotion of Education.

5 Analysis of Assessment Criteria

As outlined earlier in 2.1, for each thematic area, activities completed by the KGVK were identified and assessed using the following criteria:

- Relevance and Convergence
- Impact and Effectiveness[6]
- Sustainability

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

5.1 Relevance and Convergence

Ramgarh district in Jharkhand grapples with a multitude of challenges related to both socioeconomic backwardness and natural resource management. As the challenges that people of these villages face is in the form of water security, single cropping pattern, and inadequate income from agriculture, the HRDP focussed on promoting water and farm management in addition to land interventions under Natural Resource Management. Further, the programme also focused on agriculture training and support, SHG/women development, livestock management and entrepreneurship development under Skill Training and Livelihood Enhancement; educational support under Promotion of Education; health camps, kitchen garden, common bathing units and provisions for drinking water, under Healthcare and Sanitation.

The improper utilization of natural resources, coupled with unsustainable agricultural practices, has led to environmental degradation, affecting the livelihoods of local communities. Major work under HDFC *Parivartan* devised a comprehensive approach that combined efforts to improve socioeconomic conditions with sustainable natural resource management strategies tailored to the needs of the villages.

The evaluation observed that there was convergence or utilization with the existing schemes of the government. This implies that the programs were designed to work in harmony with the ongoing government schemes and initiatives. National schemes like MGNREGA and state specific initiatives of the agriculture department were leveraged for the implementation of specific activities. Jalminar drinking water system, solar lift irrigation system, solar powered common bathing units and solar streetlights converge with Jharkhand Renewable Energy Development Agency (JREDA) for the development and deployment of new and renewable energy resources for supplementing the energy requirements of the state and to generate public awareness in facilitating deployment of new and renewable energy systems.

5.2 Sustainability

The project has demonstrated a strong commitment to its continuation even after the designated project years. The establishment of Village Development Committees and the hiring of Community Resource Person have proven instrumental in effectively managing HDFC funds during the project intervention. As a result, project villages have successfully sustained maintenance groups for all the infrastructural interventions, routinely maintaining contribution funds for the effective utilisation of the assets. These maintenance groups work under the Village

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

Development Committees and are successful in proper maintenance of resources provided through HDFC interventions. The knowledge gained from the community's collective maintenance of resources has been invaluable in sustaining many practices that were not previously implemented. The adoption of strawberry cultivation has been undertaken even by farmers who did not receive formal training by viewing the success of HDFC led strawberry cultivation in the project area.

In the realm of Skill Development and Livelihood Enhancement, farmers continue to actively participate in training sessions on new scientific farming practices and some farmers maintain nurseries for vegetable farming. This proactive approach has facilitated the adoption of environmentally friendly agricultural practices, reducing input costs for farmers. Women involved in SHG initiatives have displayed remarkable dedication to maintaining their SHGs and are expressing keen interest in pursuing new entrepreneurial endeavours, thanks to the project interventions in enterprise support. Tent lending business by SHG's have increased income and continue to be a successful enterprise in the region. The Kishori Samuh developed through HDFC, has brought many adolescent girls together, some of whom are active in mushroom farming enterprise, lac bangle making and maintaining kitchen gardens for nutrition. Fisheries intervention undertaken in the developed wells and ponds has led to an alternate source of income apart from agriculture. The Animal Healthcare workers have aided in reducing livestock death through proper vaccination of livestock at nominal prices. There is a joint initiation between awareness generation and deploying adequate resources to harness the knowledge developed through HDFC interventions.

The adoption of kitchen gardens has been widespread, even among households that did not receive formal training through HDFC Bank. Referrals from project health camps have been diligently attended to by village hospitals, with comprehensive treatment plans developed for the individuals concerned. The use of solar powered structures for community bathing and Jalminar drinking water have significantly reduced the manual load especially on women and increased the quality of life in project villages.

The educational interventions have proven particularly advantageous in establishing enduring structures such as smart classes that contribute to the sustained attention and well-being of students. Teachers note the decrease in dropout rates in students and are motivated to develop more such structures looking at the success and impact it has created on students.

In conclusion, the project's unwavering commitment to post-project continuity, coupled with the community's active engagement and implementation of sustainable practices, has fostered remarkable progress in various areas of intervention. The project's impact is not only evident during its tenure but also endures well beyond, leaving a positive and lasting legacy for the development and well-being of the project villages and their residents.

While assessing the sustainability of this project, it is crucial to keep in mind that the COVID-19 pandemic hit in the middle of the project implementation period. Hence the scale of the project and continuous follow up got limited. Even with this huge challenge, the project has still managed to gain significant on-ground results.

6 Recommendations

To further improve the outcomes of HRDP in Ramgarh district of Jharkhand, the following recommendations are made for the HDFC Bank's *Parivartan* and HRDP teams and the implementing partner, under each thematic area:

6.1 Natural Resource Management

- There needs to be more investment in seed banks and other input provision which has been most crucial in increasing farmers' income.
- A follow-up by agriculture experts is needed to ensure farmers are making use of the practices taught and assist them in their problems.
- Increase in the budget for installation of more motor and solar irrigation systems as irrigation continues to be a challenge in the area.
- For a committed push to organic agriculture, the concept can be seeded and promoted through the vehicle of farmer producer organisations for better effectiveness of the initiative.
- Promotion of post-harvest techniques for collection and storage will impact the shelf-life and quality of produce.

6.2 Skill Training and Livelihood Enhancement

- Handholding support to enterprises for marketing tie-up, business plan development, linkages with government schemes, etc. is essential.
- More income-earning opportunities and business-related training for women and youth as there is lack of non-farm based opportunities in the project area.
- More advanced training on production practices and the use of machines/tools for farmers to keep pace with the demands of the market.
- Various training programs for SHG's for group enterprises can be supported in the region.
- For long-term sustainability of the interventions, the project can incorporate training of youth in the villages on parapet services for better access to basic veterinary services as well as information on livestock management.

6.3 Health and Sanitation

- The project's scope to focus on capacity building and awareness generation regarding health and sanitation will improve health conditions specially on the use of alcohol.
- The sensitisation programmes on health issues and menstrual hygiene along with distribution of sanitary pads will help in changing the lifestyle during menstrual cycle and help in reducing stigma around the same.
- For expanding the coverage of piped water supply to villages as there is a problem of safe and accessible drinking water, more Jalminar structures are urgently required in all villages.

6.4 Promotion of Education

- The scaling up of digital support to schools is crucial.
- Assistance in infrastructure development like classroom construction as the student-classroom ratio is low, and the funds received by the government are insufficient for construction work.

- An asset maintenance fund/committee needs to be established in the programme supported schools to ensure the necessary maintenance of support functions such as- drinking water post and smart classes. Proactive convergence with ongoing schemes of the government will ensure efficient use of resources.

The HRDP program in Ramgarh district, Jharkhand, led by the KGVK across 14 villages, had a multi-faceted approach. It encompassed NRM interventions, including fencing and irrigation, resulting in a 60% increase in gross income and 70% increase in net income for farmers. Skill development & livelihood enhancement initiatives focused on agricultural training, self-help group support, and livestock management, benefiting households through increased productivity and income. Health and sanitation efforts, such as health camps, community bathing structures, Jalminar drinking water system and kitchen garden training, improved physical well-being and reduced food expenses. Promotion of education initiatives, including smart classroom, library construction and awareness activities, positively impacted student enrolment, attendance, and learning outcomes, with teachers reporting reduced dropout rates and improved concept retention.

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%;

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

S_e= margin of error, set at 5%;

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 nine programme 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 eight villages acted as the sampling frame for the programme. This list was obtained from the implementing partner –Krishi Gram Vikas Kendra. Simple random sampling was done to select the required number of households from within the list. Since beneficiary selection was undertaken independently for each programme, 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 Water Storage Structures under HRDP in Jharkhand

S. No.	Type of Water Storage Structure	Village	No.	Area (Acre)	Volume (CUM.)	Depth (Feet)	Type of Beneficiary
1	Farm Pond (Size: 100'x100'x10')	Kachudag	3	14.8	8071.53	10	Farmer
2	Farm Pond (Size: 100'x100'x10')	Kander	3	14.2	8071.53	10	Farmer
3	Farm Pond (Size: 100'x100'x10')	Siur	4	17.4	10762.04	10	Farmer
4	Farm Pond (Size: 100'x100'x10')	Sidhwarkala	2	9.2	5381.02	10	Farmer
5	Farm Pond (Size: 100'x100'x10')	Garke	4	18.2	10762.04	10	Farmer
6	Farm Pond (Size: 100'x100'x10')	Budhakhukhara	3	14	8071.53	10	Farmer
7	Farm Pond (Size: 100'x100'x10')	Dohakatu	2	9.2	5381.02	10	Farmer
8	Farm Pond (Size: 100'x100'x10')	Bankheta	3	14.5	8071.53	10	Farmer
9	Farm Pond (Size: 100'x100'x10')	Lolo	4	18.1	10762.04	10	Farmer
10	Farm Pond (Size: 100'x100'x10')	Jamsingh	5	22.5	13452.55	10	Farmer
11	Farm Pond (Size: 100'x100'x10')	Bhaipur	3	13.6	8071.53	10	Farmer
12	Farm Pond (Size: 100'x100'x10')	Usra	4	18.3	10762.04	10	Farmer
13	Farm Pond (Size: 100'x100'x10')	Goratu	3	13.8	8071.53	10	Farmer
14	Low Land Well (Size:15'x15')	Kachudag	5	9.5	337.45	15	Farmer
15	Low Land Well (Size:15'x15')	Kander	5	9.5	337.45	15	Farmer
16	Low Land Well (Size:15'x15')	Siur	5	9.5	337.45	15	Farmer
17	Low Land Well (Size:15'x15')	Sidhwarkala	4	7.6	269.96	15	Farmer
18	Low Land Well (Size:15'x15')	Garke	8	15.2	539.92	15	Farmer
19	Low Land Well (Size:15'x15')	Budhakhukhara	8	15.2	539.92	15	Farmer
20	Low Land Well (Size:15'x15')	Dohakatu	5	9.5	337.45	15	Farmer
21	Low Land Well (Size:15'x15')	Bankheta	4	7.9	269.96	15	Farmer
22	Low Land Well (Size:15'x15')	Lolo	7	12.3	472.43	15	Farmer
23	Low Land Well (Size:15'x15')	Jamsingh	6	11.7	404.94	15	Farmer
24	Low Land Well (Size:15'x15')	Bhaipur	5	9.8	337.45	15	Farmer
25	Low Land Well (Size:15'x15')	Usra	7	13.5	472.43	15	Farmer

26	Low Land Well (Size:15'x15')	Goratu	7	12.9	472.43	15	Farmer
27	Low Land Well (Size:15'x15')	Kushumbha	4	7.9	269.96	15	Farmer
28	Checkdam	Lolo	1	14.5	6075.42	4	Community

C HRDI Methodology

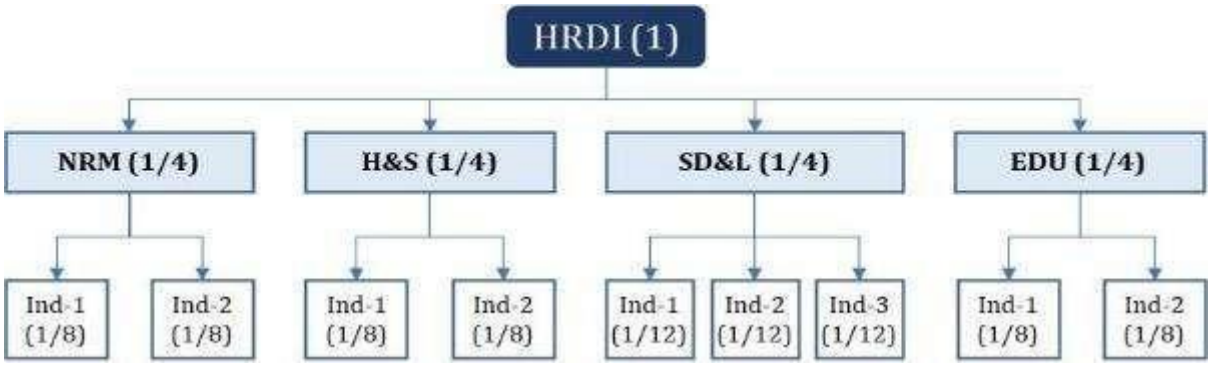
The outcome indicators included in the HRDI were obtained from different domains and are consequently measured on different scales. Therefore, to ensure the comparability of these indicators, all the indicators were converted into discrete variables such that the indicators could be measured between 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.

C.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 27: 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 9: 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 availability of drinking water facility	(1/4) x (1/2) = 0.125
	Percentage of households with access to improved toilet facility	(1/4) x (1/2) = 0.125
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.

C.2 Analysis Plan

HRDI for Ramgarh 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.

C.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 Ramgarh has been detailed below (see **Error! Reference source not found.**).

Table 10: HRDI Calculation for Ramgarh

Domain	Indicators	Baseline	HRDI	End line	HRDI	% Change
NRM	Proportion of farmers with net income above median	0.16	0.10	0.23	0.14	40%
	Proportion of farmers reporting increased productivity of three main crops above median (before and after)	0.16		0.25		
	Percentage of farmers reporting access to irrigation	0.08		0.08		
ST&LE	Percentage of SHG members reporting income above	0.28	0.12	0.50	0.24	100%

Domain	Indicators	Baseline	HRDI	End line	HRDI	% Change
	median from rural enterprises					
	Percentage of HH reporting income above median from livestock	0.20		0.48		
H&S	Percentage of households reporting increase in use of fruits/vegetables from the nutrition garden	0.16	0.11	0.31	0.23	109%
	Percentage of households reporting increase availability of drinking water	0.23		0.29		
	Percentage of households with access to improved sanitation facility	0.05		0.31		
PoE	Percentage of respondents reporting increased access to functional school physical infrastructure (smart class, furniture etc.)	0.40	0.15	0.43	0.20	33%
	Percentage of respondents reporting increased access to functional learning infrastructure (library, science labs, smart class, etc.)	0.19		0.39		
Total			**0.48**		**0.82**	**71%**

D Overview of Impact Calculation

Impact of the programme was calculated based on the averages of quantitative output indicators as demonstrated below (see Table 11).

Table 11: Impact Calculation

Outputs	Output Indicators		Output Avg	Impact Level
Increased income from agriculture				
Land/ crop productivity	Proportion of farmers reporting increase in production of crops that were supported under HRDP	97%	65%	Medium
	Proportion of farmers reporting increased income from crops that were supported under HRDP	83%		
	Average increase in productivity from crops that were supported under HRDP (% change)	49%		
	Average increase in input cost (% change)	31%		
Access to the farm management infrastructure	Proportion of beneficiaries satisfied with the quality of available services (in farm management)	91%	90%	High
	The proportion of farmers reporting an increase in the use of natural fertilizers	90%		
Increased adoption of crop diversification	Proportion of farmers diversifying their crops with project support	64%	45%	Medium
	Proportion of farmers who report income increase due to crop diversification (base = farmers who adopted crop diversification)	41%		
	Proportion of farmers who adopted horticulture/floriculture	31%		
Land under irrigation	Percentage Increase in land area under irrigation	5%	6%	Low
	The proportion of farmers who received support for irrigation	7%		
Increased use of clean energy solutions				
Adoption of clean energy infrastructure	Proportion of HHs using clean energy infrastructure (Base=all)	72%	79%	High
	Proportion of households reporting clean energy infrastructure being operational (Base=clean energy beneficiaries)	86%		
Improved access to agricultural training and services				
Access to Agriculture training and services	Proportion of farmers who accessed project training services	58%	57%	Medium
	Proportion of farmers who demonstrate awareness regarding sustainable farming practices	57%		

Adoption of improved farming practices	Proportion of farmers who adopt scientific agricultural practices	40%	73%	High
	Proportion of beneficiaries reporting an increase in productivity due to better farm management	91%		
	Proportion of farmers reporting increased income	90%		
Enhanced capacity for regular income generation				
Formation/ revival of SHG-based Enterprises	Proportion of members who received support with establishing/reviving SHGs enterprise	63%	77%	High
	Proportion of members whose SHGs are currently functioning	92%		
Improved capacity to generate income through livestock management				
Improved capacity to generate income through livestock management	Proportion of beneficiaries who received support in livestock management services	27%	49%	Medium
	Proportion of beneficiaries reporting an increase in income through livestock	65%		
	Proportion of beneficiaries reporting increase in livestock health	57%		
Improved health infrastructure and services				
Establishment/ enhancement of health infrastructure and services	Proportion of beneficiaries who gained access to health services	68%	76%	High
	Proportion of beneficiaries reporting improvement in dietary habits	84%		
Improved Sanitation infrastructure and services				
Establishment/ enhancement of sanitation infrastructure	Proportion of beneficiaries who gained access to sanitation services	64%	65%	Medium
	No. of women with access to community bathing units	66%		
Improved availability and management of water				
Access to drinking water at household and community levels improved	Proportion of households who received drinking water interventions	36%	53%	Medium
	The proportion of households reporting decrease in instances of water borne diseases in the family	70%		
Development of kitchen gardens				
Increased adoption of kitchen gardens	Proportion of HHs reporting improved nutrition from kitchen gardens	76%	85%	High
	No of HHs received seeds/training in kitchen garden	90%		
	No of HHs with reduced expenditure	79%		
	Proportion of HHs reporting fully satisfied of the intervention	94%		
Improved capacity of educational institutions to provide services				

Access to improved physical infrastructure	Proportion of teachers who report gaining access to functioning libraries, smart class, furniture	84%	92%	High
	Proportion of students who gained access to smart class at education institutions	100%		
Improved willingness to engage in school activities	Teachers reporting improvements in attendance due to improved infrastructure	100%	81%	High
	Proportion of teachers reporting an increase in enrolment post infrastructure development	65%		
	Proportion of teachers reporting a decrease in dropout rates post infrastructure development	79%		

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

E Two Sample Proportion 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 income from agriculture above baseline median-is shown below.

Table 12: Z-tests Conducted for P0249

Indicator 1	Proportion of farmers with income from agriculture above baseline median
p1 (proportion of first sample-endline)	71
n1 (sample size of p1)	370

p2 (proportion of second sample-baseline)	48
n2 (sample size of p2)	370
p	0.1607027027
Calculation	0.02700123561
z statistic	8.607013521
	Statistically significant at 95% confidence level (or p<0.05)
p-value for the z statistic	<0.00001

F 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 Table 12).

Table 13: 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		✓	✓	
SHG Development		✓		✓
Livestock Management	✓	✓	✓	
H&S				
Health		✓		
Kitchen Garden	✓	✓	✓	✓
Sanitation	✓	✓	✓	✓
Drinking Water	✓	✓	✓	✓
PoE				
Educational Institutions Development	✓	✓	✓	✓
Awareness Generation				