Impact Assessment Study of Holistic Rural Development Programme (HRDP) Kheda, Gujarat – P0275

Prepared For:

HDFC BANK | PARIVARTAN
A step towards sustainable progress

HDFC Bank Corporate Social Responsibility (CSR)

Prepared By:

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An Intellecap Subsidiary

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Table of Contents

Table of Contents ..... **i**

List of Tables ..... **iii**

List of Figures ..... **iv**

Executive Summary ..... **v**

1 Introduction **1**

1.1 About HRDP 1

1.2 Objectives of Impact Assessment 1

1.3 Conceptual Framework Adopted 2

1.4 About the Project Area 2

1.5 Implementing Partner in the District 3

2 Research Design and Methodology **4**

2.1 Criteria for Assessment 4

2.2 Primary and Secondary Data Sources 4

2.3 Sample Size and Distribution 5

2.4 Training of Enumerators 6

3 Programme Planning and Implementation **7**

3.1 Selection of Project Area 7

3.2 Programme Implementation 8

3.3 Monitoring and Evaluation 9

4 Study Findings **10**

4.1 Natural Resource Management 11

4.2 Skill Training and Livelihood Enhancement 16

4.3 Health and Sanitation 20

4.4 Promotion of Education 22

4.5 Holistic Rural Development Index (HRDI) 25

5 Analysis of Assessment Criteria **27**

5.1 Relevance and Convergence 27

5.2 Sustainability 27

6 Recommendations **29**

6.1 Natural Resource Management 29
6.2 Skill Training and Livelihood Enhancement 29
6.3 Health and Sanitation 29
6.4 Promotion of Education 29
Annexures 31
A Sampling Methodology 31
B HRDI Methodology 33
C Overview of Impact Calculation 36
D Two Sample Proportions Z Test 38
E Theme-wise Sustainability Matrix 40

List of Tables

Table 1: Summary of Key Income Indicators vi
Table 2: Summary of HRDI Scores vi
Table 3: Population Sample Covered 5
Table 4: Activities under Four Thematic Areas in Kheda 8
Table 5: Quantum of Activities under each Activity Category of Four Thematic Areas 10
Table 6: Increase in Agricultural Production After the HDFC Project 13
Table 7: HRDP Interventions that led to increase in agriculture production 13
Table 8: HRDI Calculation for P0275 25
Table 9: Example of HRDI Calculation 32
Table 10: HRDI Calculation for Kheda 33
Table 11: Impact Calculation 35
Table 12: Z-tests Conducted for P0275 37

List of Figures

Figure 1: Conceptual Framework..... 2
Figure 2: Age Group Wise Distribution of Sample ..... **Error! Bookmark not defined.**
Figure 3: Planning and Implementation Process 7
Figure 4: Distribution of Sample Based on their Occupation.....10
Figure 5: Education qualification wise distribution of sample.....10
Figure 6: Type of ration card.....10
Figure 7: Increase in Agriculture Income (INR).....12
Figure 8: HRDP interventions that contributed to increase in income.....12
Figure 9: Perceived benefits of natural fertilizers.....14
Figure 10: Overview of Impact and Effectiveness of Interventions -NRM.....15
Figure 11: Percentage of farmers who learned new agriculture practices.....16
Figure 12: Percentage of farmers who received agriculture training on new techniques.....17
Figure 13: Perceived benefits of learning agriculture practices.....17
Figure 14: Improvements in farming after adopting the agriculture techniques.....17
Figure 15: SHG trainings received as part of the project.....18
Figure 16: Benefits of Livestock Interventions.....19
Figure 17: Overview of Impact and Effectiveness of Interventions -ST&LE.....19
Figure 18: Perceived benefits of Health Camps.....20
Figure 19: Benefits of kitchen garden as reported by beneficiaries.....21
Figure 20: Overview of Impact and Effectiveness of Interventions -H&S.....22
Figure 21: Percentage of teachers who reported different interventions under education in their school.....22
Figure 22: Perceived benefits of learning materials according to students.....25
Figure 23: Perceived benefits of libraries according to students.....23
Figure 24: Perceived benefits of infrastructure interventions according to teachers.....24
Figure 25: Overview of Impact and Effectiveness of Interventions -PoE.....24
Figure 26: Domain and Indicator Weights.....32

Executive Summary

The study centres on measuring the impact of the Holistic Rural Development Programme (HRDP) of HDFC Bank that was implemented by Foundation for Ecological Security in the Kheda district of Gujarat during April 2019 till March 2022. This study largely focused on understanding the overall process that the HDFC Bank and the implementing organisation undertook in carrying out the programme activities, the key milestones achieved, the impact created by these activities, and the challenges faced. The key focus areas of the intervention were Natural Resource Management (NRM), Skill Training & Livelihood Enhancement (ST&LE), Health and Sanitation (H&S) and Promotion of Education (PoE). The framework used for the impact assessment was an adaptive version of the DAC criteria - Relevance, Effectiveness, and Sustainability. A comprehensive methodology, comprising both qualitative and quantitative primary data collection, was used for the assessment which was carried out in a participatory manner involving all the key stakeholders of the programme. The study included a sample size of 398 beneficiaries as respondents as against the planned sample of 400.

NRM: HRDP focused on tailored interventions, under Natural Resource Management including wire fencing, solar irrigation, gabion construction and land levelling. **The project led to a 20% increase in gross income and 40% increase in net income.** Farmers reported improved productivity and benefits from using natural fertilisers. Floriculture training provided an additional income source, with 87% of beneficiaries highlighting its primary benefit. The onset of these interventions has significantly impacted the local population. The widespread use of gabions and wire fencing has been particularly noteworthy, as farmers have highlighted how these practices have fostered a deeper understanding of collaborative resource management for the collective benefit of all stakeholders. A community-driven approach has emerged, leading to the establishment of more gabions aimed at safeguarding the region from ravine formation. Previously, individual farmers were hesitant to undertake land levelling interventions, fearing potential adverse effects on soil fertility and the viability of substantial investments in agriculture. However, through the project interventions, many have come to appreciate the feasibility and advantages of land levelling for their respective farms.

Skill Training and Livelihood Enhancement: Under skill training and livelihood enhancement, the project focused on agricultural training, Self-Help Group (SHG) revival, and pucca flooring for livestock. Around 32% of households benefitted from agricultural training, resulting in increased productivity and reduced input costs. SHG development supported 14% of respondents, empowering women with entrepreneurship opportunities. Approximately 34% of respondents benefitted from interventions in livestock management, notably through pucca flooring construction, leading to improved livestock health and increased household income by 50%.

A considerable number of farmers have adopted the practice of using natural fertilisers to some extent. Moreover, SHG women have greatly benefited from trainings on record-keeping and the regular carrying out of routine SHG activities, which they have continued to apply with the support of the project interventions.

Health and Sanitation: The Health and Sanitation interventions included health camps/sessions and kitchen garden training. Health camps were attended by 48% of the sample, with beneficiaries reporting improved physical activity and health status. Kitchen garden support resulted in reduced

food expenses, improved nutrition, and savings of around INR 2000 per month for households. The community showed awareness of the benefits of having a kitchen garden. The introduction of kitchen garden interventions has proven instrumental in providing nutritious food to households, gaining widespread adoption among families in the project area.

Promotion of Education: A combination of multiple activities targeted towards improving enrolment, attendance, and learning outcomes were undertaken in the programme area. The programme focused on interventions on Educational Institutions Development which includes school library construction, construction of building as learning aid (BaLA) wall paintings, establishing reverse osmosis (RO) coolers, and awareness activities. These efforts have been successful in improving enrolment, attendance, and learning outcomes of students. The library setup and BaLA paintings enhanced students' reading and comprehension, while RO coolers provided safe drinking water. Teachers reported reduced dropout rates, improved concept retention, and increased attendance due to these interventions. Awareness campaigns further helped children understand the significance of natural resource practices. Significant improvements in education infrastructure have contributed to enhancing the overall school environment and educational outcomes.

Table 1: Summary of Key Income Indicators

Income Indicators (based on median)	Before	After	% Change
Average Net Income from Agriculture (INR)	32,000	45,000	40%
Average Income from SHG (INR)	444	1,733	290%
Average Income from Livestock (INR)	3000	3500	16%
Average Productivity of 4 major crops (Qtl. /Acre)	8.66 kg/acre	10.93 kg/acre	26%

The above table indicates there is an increase of average net income from agriculture which is primarily due to programme's support in land management along with organic farming to increase the productivity of crops during the endline year. There has been a 16% income in average income from Livestock. SHG income has an exponential growth of 290% owing to the increase in involvement of more women in project villages in SHG development.

HRDI Indicators

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
	0.08	**0.10**	**0.09**	**0.16**	**0.07**	**0.19**	**0.15**	**0.20**	**0.42**	**0.73**
% Change	25%		78 %		171%		33%		74%	

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

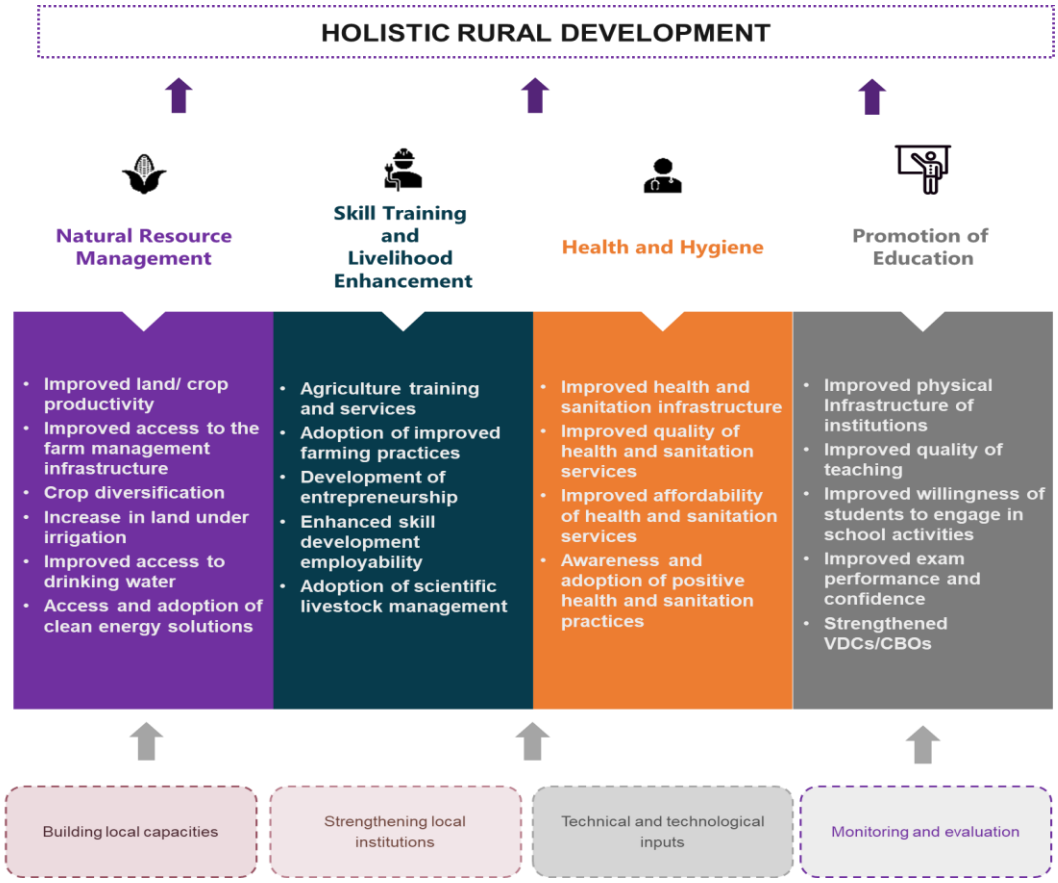
- Provide evidence-based findings to inform future operational and strategic decisions while planning and funding partner organisations

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 Gujarat, Kheda, by Foundation for Ecological Security, the implementing partner in this district. The programme was undertaken during April 2019 till March 2022 and the interventions covered 10 villages across the Kheda district. The villages were selected as they face challenges in the form of water security, single cropping pattern, and inadequate income from agriculture along with societal challenges.

1.5 About the Implementing Partner – FES

Foundation for Ecological Security (FES)' history goes back to 1986 when at the request of National Wastelands Development Board, Tree Growers Cooperative Project was initiated. In 1988, an Apex Cooperative namely the National Tree Growers' Cooperatives Federation (NTGCF) was set up to promote village level Tree Growers' Cooperatives to improve the productivity of revenue wastelands. New opportunities to work on different land categories through a variety of village level institutions provided a more enabling environment to address the critical task of ecological restoration in the country and led to the setting up of the Foundation for Ecological Security in 2001. As of June 2018, FES is working across 32 districts in eight states in India. FES has helped bring 5.47 million acres of common lands under common management by local villagers. These commons support the livelihoods of more than 16,032 villages and over 8.67 million people.

The Commons Initiative of FES helped draft common land policy in Rajasthan and Andhra Pradesh designing programmes leveraging MGNREGA, IWMP and NRLM; filing Intervention Application at the Supreme Court; drafting a sub-committee report on Commons under the 12th Plan and implementing a media campaign on Commons in Rajasthan.

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 Foundation for Ecological Security.

2.1 Criteria for Assessment

For each thematic area, activities completed by the SM Sehgal Foundation were identified. The impact of these activities was assessed using the following criteria:

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

Under the criterion of **relevance and convergence**, the team assessed whether the design of the 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 Focused Group Discussions (FGDs) with programme beneficiaries, Foundation for Ecological Security (FES) team, and the HDFC Bank programme team. IDIs were conducted with the farmer beneficiaries, implementing partners, schoolteachers, and livestock beneficiaries. FGDs were conducted with farmers group, self-help groups and with the village development committees 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

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

were identified for each thematic area (NRM, ST&LE, H&S and PoE). Based on the standardized list of outcomes and outputs, the questionnaire was developed.

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 ten villages of Kheda where the programme was implemented, beneficiaries were selected using purposive random sampling from a list of beneficiaries obtained from Foundation for Ecological Security 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 nine villages was 400, out of which 398 sample respondents were reached. The thematic areas wise sample covered was as follows (see **Error! Reference source not found.**).

Table 3: Population Sample Covered

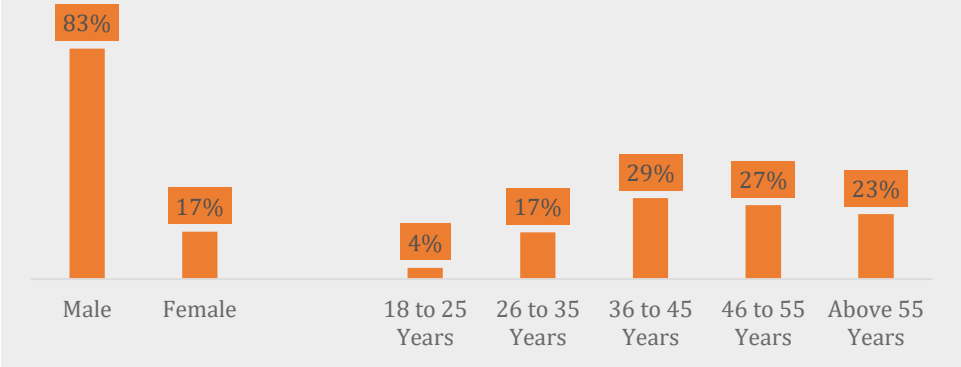
District Name	NRM	ST&LE	H&S	PoE[2]
Thasara	204	150	144	42
Galteshwar	156	112	101	48
Total	360	262	245	90

Qualitative tools of in-depth interviews (IDI) and focus group discussions (FGD) 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 10 FGD's with Village Development Committee, Self Help Groups and farmer groups were conducted in the project area. 11 In Depth Interviews were conducted amongst school teachers, farmers, community resource persons, sarpanch, implementing partners and beneficiaries.

[2] The limited sample covered in few of the villages was due to the unavailability of respondents with respect to education. As the schools were closed in lieu of summer vacation, the teachers and students could not be surveyed.

Total sample includes 82% males and 17% females. The highest number of respondents, 29% belonged to the age category of 36-45 years. This was followed by 27% of the respondents belonging to 46-55 years, and 17% belonging to 26-35 age category.

Figure 2: Age Group wise distribution of Sample



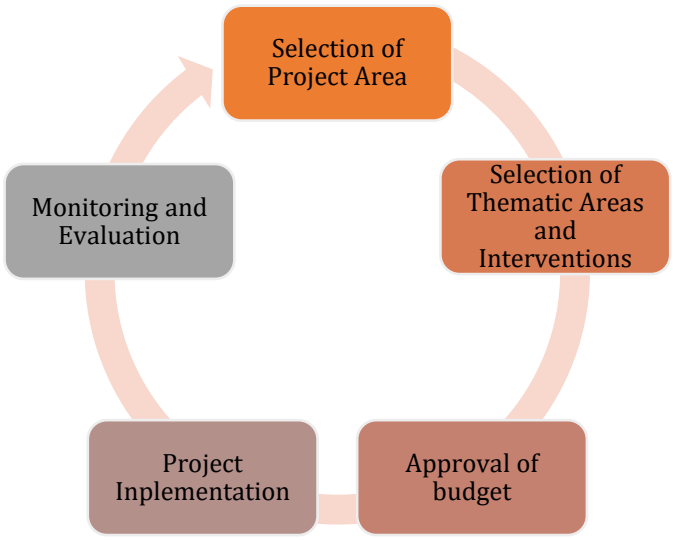
2.4 Training of Enumerators

A gender balanced survey team consisting of 6 local enumerators and 1 supervisor 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 explained about the project, data collection tools, how to use CAPI, data collection protocols, data quality control etc. The training included both classroom teaching and mock practice of the survey tool.

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 2: Planning and Implementation Process



3.1 Selection of Project Area

The River Mahi, originating in Southern Rajasthan and passing through Panchmahal, Vadodara, Kheda, and Anand districts of Gujarat, eventually flows into the Arabian Sea at the Gulf of Khambhat. Along this river, villages are facing severe degradation caused by deep and continuous ravine gullies. These ravines have impacted approximately 96 Panchayats (218 habitations) within a 120 km stretch from VanakBori (Panchmahal district) to Dhuvaran (Anand district).

The 120-kilometer stretch of River Mahi has an undulating topography, loose and sandy-to-sandy loam soil, and lacks vegetation. Ravines, ranging from 10 to 70 feet deep, originate at the riverbanks and encroach into nearby common lands and farmlands during monsoon seasons, leading to extensive erosion along both banks. Villages located on the riverbanks and surrounding common lands and farmlands are particularly vulnerable to the increase in ravine formations. In some cases, even villages further from the riverbank, up to the second and third layers, have been affected. Around 35,000 hectares of common and farmland on both sides of River Mahi suffer from ravines, causing an annual loss of approximately 28.34 MT/hectare of soil. The lack of tenurial rights over these ravine lands discourages communities from investing in restoration efforts, resulting in continuous degradation and ravine infestation in the affected lands. The severity of riverbank erosion has already led to the relocation of some villages, with others remaining at risk in the future.

The project villages in Thasra and Galteshwar blocks of Kheda district, known as "Charotar" in central Gujarat, experience moderate rainfall (700 - 800 mm) and temperature variations. Most residents depend on agriculture and animal husbandry, with many being small and marginal

farmers. The loss of farmlands and common lands due to ravine formation poses a significant threat to the livelihoods of the poorest farmers and negatively impacts the local economy. Given the widespread occurrence of ravines and reduced agricultural yields due to high soil erosion, continuous efforts are crucial to improving productivity in the ravine farmlands and common lands, thereby building resilience in livelihoods within these villages.

Considering the above challenges in the area, HRDP interventions focused on promoting water and farm management. The programme also focused on agricultural training and support, skill training, livestock management, and SHG development under ST&LE; educational institution development and education support under PoE; health awareness and kitchen garden H&S.

The activities specific to each village under the programme were decided after in-depth consultation with the respective Village Development Committees (VDCs), which were constituted during the beginning of the project implementation. Activities under each of the four thematic areas are as follows (see Table).

Table 4: Activities under Four Thematic Areas in Kheda

Activity Category	Activities	Output Indicators
NRM		
Irrigation Management	Check dams, pond renovation, solar irrigation	Income from agriculture
Farm Management	Deep ploughing, plantation, gabions, land levelling, wire fencing	
ST&LE		
Agriculture Training and Services	Exposure visits, demonstration of new crops, training on organic farming and agricultural conservation practices	Access to Agriculture Training and Services
SHG Based Women Empowerment	Strengthening of SHG through bookkeeping trainings, distribution of sewing machine	Skill and Entrepreneurship Development
Livestock Management	Pucca flooring	Livestock Management
H&S		
Health	Health camps, hygiene related awareness sessions	Health Infrastructure and Services
Kitchen Garden	Kitchen garden promotion, training, distribution of seeds	Health Services
PoE		
Educational Institutions Development	Infrastructure: Construction of library, BaLa, drinking water set up	Infrastructure in Educational Institutions
Awareness Generation	Celebration of Gandhi Jayanti, toilet day, world commons week etc	Awareness generation

3.2 Programme Implementation

The interventions for community empowerment and rural development are crucial for target villages. Under the HRDP intervention for Natural Resources Management, have focused on gabion and stone building structures to combat the ravination of land. Additionally, wire fencing from wild animals and land levelling have also been key activities to increase productivity of land and finally, solar irrigation pumps have been built for irrigation management.

As livestock is a major source of income for agrarian households, pucca flooring for cattle was implemented through project interventions. 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, exposure visits of farmers were done along with demo plots and trainings on better farm techniques. Promotion of new women SHGs and revival of inactive SHGs in the villages including financial literacy trainings to SHGs and if required linking them to banks was also done as part of the project interventions.

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. There were health sessions and camps conducted in the village for overall health awareness.

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.

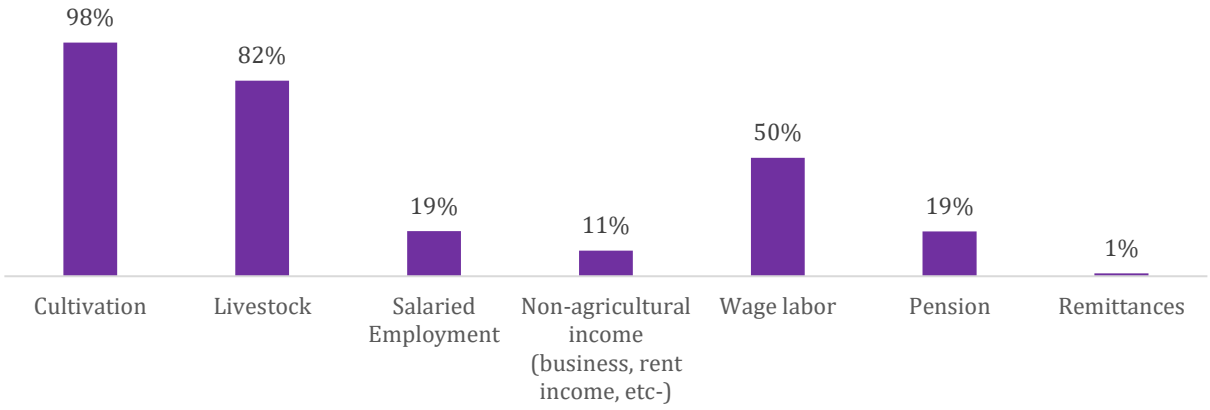
3.3 Monitoring and Evaluation

The impact of Foundation for Ecological Security 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 ten villages of Narmada district in Gujarat. All respondents have more than one source of income. 98% of respondents generate income through cultivation, followed by 82% reporting income from livestock. 50% income is generated through wage labour.

Figure 4: Distribution of Sample based on their occupation



The educational status of the respondents shows that 14% of the respondents are illiterate and do not know how to read and write. 26% of the respondent's received education till 6th to 8th Standard followed by 25%, who studied till 9th to 10th standard. In higher education, of the respondents, 4% are graduates.

The social category of the interviewees is mainly from the Other Backward Classes (OBC) category- 65%. 34% of the respondents are of general category. 63% of the respondents have BPL cards followed by 34% of the respondents having APL cards.

Figure 5: Education qualification distribution of sample

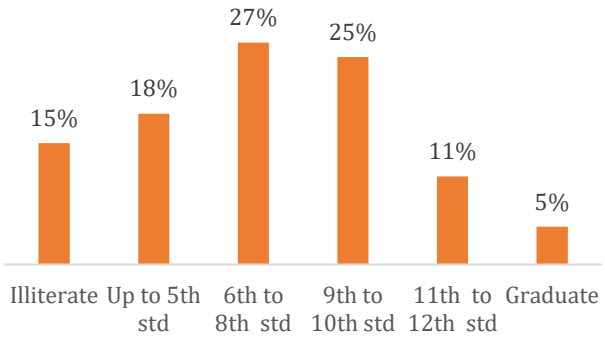
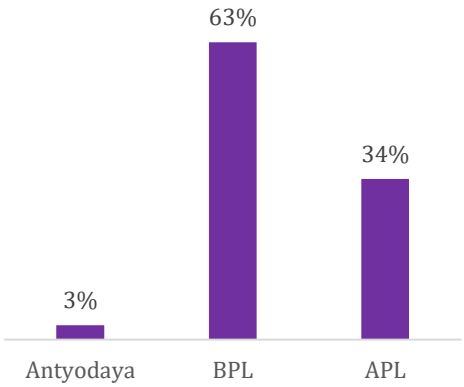


Figure 6: Type of ration card



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 of Four Thematic Areas

Activity Category	Activities	Nos. (as provided by IA)
NRM		
Farm Management	Deep ploughing Plantation Gabions Land levelling Wire fencing	136 acres for paddy 30834 saplings 42 154 acres of land 45005 running meter wire fencing
Irrigation Management	Check dams Pond renovation Solar irrigation	Info not provided by IA 4 Info not provided by IA
ST&LE		
Agriculture Training and Services	Exposure visits Demonstration of new crops Training on organic farming Agricultural conservation practices	Info not provided by IA Info not provided by IA 3090 Info not provided by IA
Skill and Entrepreneurship Development	SHG strengthening through bookkeeping Sewing Machine	13 45
Livestock Management	Pucca flooring	260
H&S		
Health	Health Camps	Annually in all village
Kitchen Garden	Kitchen Garden promotion	400
PoE		
Educational Institutions Development	Drinking water set up BaLA Library set up	Info not provided by IA 10 Info not provided by IA
Awareness Generation	Day celebration and awareness	Info not provided by IA

(Source: Project MIS from Implementing Agency)

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

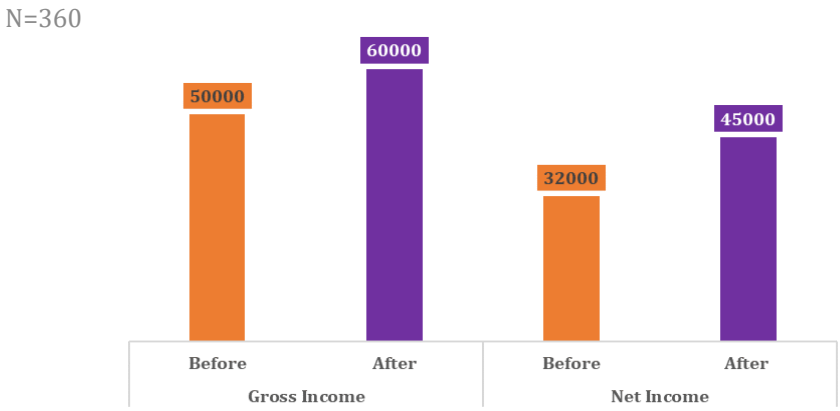
4.1 Natural Resource Management

Natural Resource Management (NRM) is one of the most important pillars of HRDP. The interventions in this pillar were designed and implemented keeping in view the needs of the community as well as suitability to the geography. The programme consisted of interventions under various activities such as trainings on non-pesticide management, distribution of seeds, imparting knowledge of various farm techniques, irrigation management, gabion construction and wire fencing. Since the focused region is prone to soil erosion due to heavy rainfall, undulating land and ravines, intervention in NRM is expected to ease the water-related issues for both household and agricultural purposes and increase the cultivable land for required households.

4.1.1 Income from Agriculture

In the survey sample, the benefits from agricultural activities were availed by 90% of the total respondents making it the most important category of interventions under HRDP. The interventions where beneficiaries were provided with solar irrigation systems, construction of gabions, organic manure trainings, land levelling and wire fencing have been the most availed and practiced activities among all the agricultural activities conducted under the intervention.

Figure 7: Increase in agricultural income (INR)

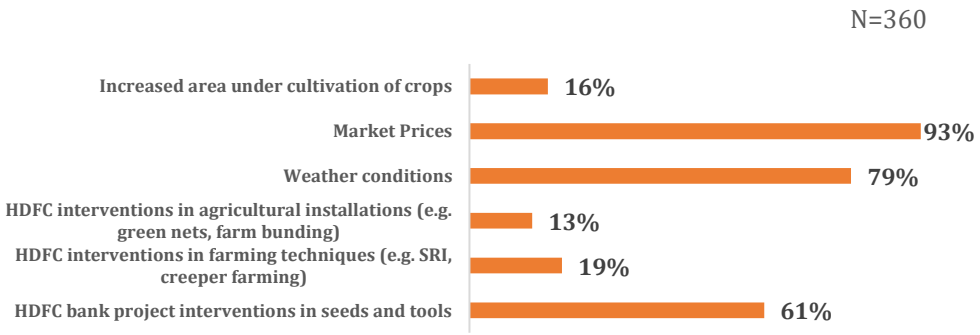


The figure 7 compares the median gross income and median net income before and after the project intervention. **The gross income increased by 20% and net income increased by 40%.** The median input cost has also risen by 25%, resulting in a sustained change in gross and net income trends.

In terms of total households reporting a change in income, **about 95% of the households reported increase in income and 87% of the households reported an increase in profit after the project interventions.** The reasons accredited for the increase were mainly the programme's interventions in market prices (93%), weather conditions (79%) and seeds and tools (61%) (Ref. Fig. 8). However, the respondents also mentioned and increased area under cultivation of crops (16%), interventions in farming techniques (21%) and interventions in agricultural installations (13%) as other reasons for an income increase since the inception of the programme. This can be measured as an indirect benefit from the project intervention. Through qualitative field interviews and discussions in the region, it was observed that through SRI cultivation of paddy and the use of better hybrid quality seeds, the nearby markets showed favorable response to the cultivation of such crops. Additionally, through gabion structures and land levelling in the region, area under cultivable land increased for farmers who were previously unable to grow crops on the land due to soil erosion. This additional patch of land has helped in the increase of household income.

While income has increased, input cost has also increased for 82% of the respondents, the primary reason being increase in the price of inputs reported by 92% of respondents.

Figure 8: HRDP interventions that contributed to increase in income



Respondents have reported an increase in the median productivity of the major crops grown in the area namely paddy, bajra and tobacco. 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)	Median Production After (kg)	% Change
Paddy	1200	1550	29%
Bajra	750	800	6%
Tobacco	800	1000	25%

Paddy and bajra were promoted through the project interventions through better seeds and farming techniques. The reason for the increase in productivity could be attributed to direct interventions - support in seeds and tools and use of better farming techniques. These interventions have helped increase yield from the same land. Additionally, indirect interventions through the treatment of land commons such as gabion construction, group wire fencing, stone bunding, land levelling etc., have increased the area under cultivation of crops as seen in Table 7.

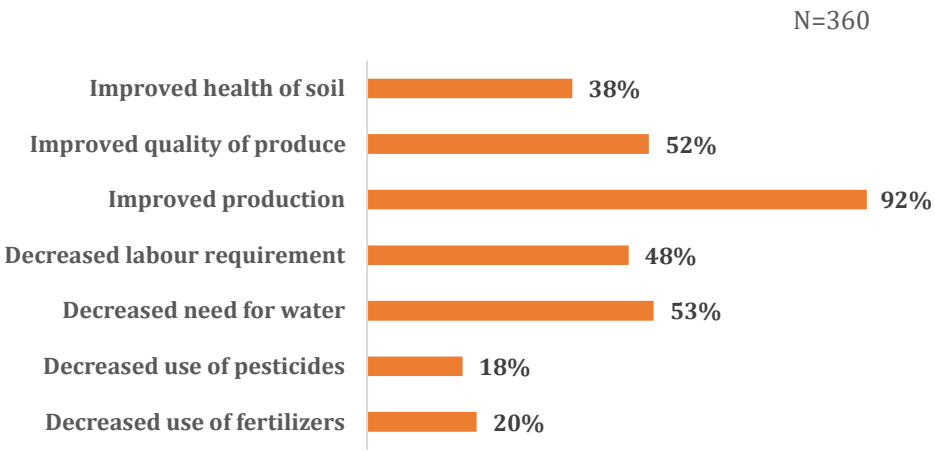
Table 7: HRDP Interventions that led to increase in agriculture production

Project Interventions (% respondents)	Paddy	Wheat	Bajra	Tobacco
HDFC bank project interventions in seeds and tools	70%	67%	79%	38%
HDFC interventions in irrigation	8%	6%	5%	6%
HDFC interventions in farming techniques (e.g., SRI, creeper farming)	18%	19%	23%	25%
HDFC interventions in agricultural installations (e.g., green nets, farm bunding)	5%	7%	14%	17%
Increased area under cultivation of crops	15%	19%	24%	27%
Improved irrigation	91%	78%	78%	90%

Currently, 96% of households report using both natural and chemical fertilizers. During the last season of the project's intervention, 56% of respondents reported an increase in the use of natural fertilizers and 32% reported a decrease in the use of chemical fertilizers. This is mainly due to the promotion of natural fertilizers through training and demonstrations during the project period. The increased use of natural fertilizers has led to benefits such as improved production (92%), improved quality of produce (52%) and decreased labor requirement among other benefits

(Figure 9). More than (90%) of the farmers are fully satisfied with the information provided on natural fertilizers.

Figure 9: Perceived benefits of natural fertilisers



4.1.2 Adoption of horticulture and crop diversification

From the sample survey, 18% of the respondents have changed the crop they used to previously grow, 95% of the respondents changed the crops due to the HDFC project interventions. Bajra is grown by 59% of the respondents followed by tobacco (13%) and castor (8%). A small section also adopted paddy and wheat on their increased land due to soil intervention methods. 91% of farmers have reported an increase in income while increase in productivity was reported by 9% of the respondents.

A small section of marginalised farmers was also given floriculture training and support through the production of mainly marigold flowers. 62% of the floriculture beneficiaries report interventions with marigold flowers whereas 50% reported with other flowers such as rose. 52% of the flowers have started flowering. In the last production year, the mean income generated from floriculture/flower plants that were planted with the support from HDFC Bank project is INR 17,000 (INR 1500 per month). 87% of the respondents note the increase in additional income to be the primary benefit of the intervention.

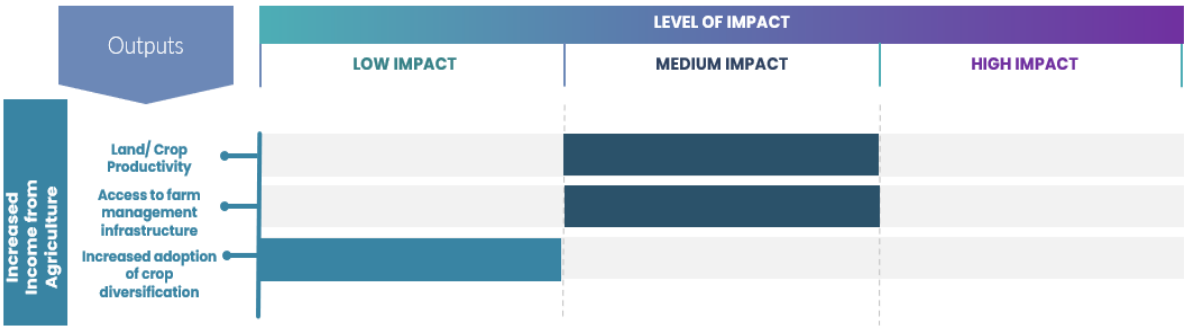
Gabion structure under HRDP

Wire fencing beneficiaries

Land levelling

4.1.3 Impact Observations

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



In the realm of natural resource management, the implementation of wire fencing, gabions, and solar pumps for irrigation has significantly impacted the local population. The widespread use of gabions and wire fencing has been particularly noteworthy, as farmers have highlighted how these practices have fostered a deeper understanding of collaborative resource management for the collective benefit of all stakeholders. A community-driven approach has emerged, leading to the establishment of more gabions aimed at safeguarding the region from ravine formation.

Previously, individual farmers were hesitant to undertake land levelling interventions, fearing potential adverse effects on soil fertility and the viability of substantial investments in agriculture. However, through the project interventions, many have come to appreciate the feasibility and advantages of land levelling for their respective farms.

4.1.4 Case Study

Farm and Irrigation Management Interventions in Kheda district

1. Gabion Construction: In the project villages, the implementation of gabion structures has played a pivotal role in mitigating the adverse effects of soil erosion and safeguarding the common and farmland areas from the encroachment and expansion of ravines in the region. These gabion structures have been strategically constructed along the riverbanks and vulnerable areas to effectively contain the ravines' advancement. By employing gabion structures, the project helped to reinforce the stability of the riverbanks, creating a formidable barrier against the erosive forces of the river and preventing further incursion into the surrounding lands. Through the implementation of these gabion structures, the project has also enhanced the resilience of the ravine farmlands and common lands within the project villages, fostering an environment conducive to sustainable agricultural practices and fostering

economic prosperity for the communities relying on agriculture and animal husbandry. The utilisation of gabion structures represents a strategic measure that aligns with the project's overarching objective of revitalising and preserving the natural landscape of the Mahi River basin. The project has been successful in creating 36 gabion structures effectively treating 1940 metres of land.

2. Solar Irrigation: Solar irrigation intervention in the project villages were implemented through nearby farmers grouped together by the aid of the Village Development Committee. Members of these groups are responsible for the maintenance and use of the solar grid with connecting pipes to all farms. This has aided farmers in reducing the expenditure of diesel pumps that were previously rented for irrigation. The cost saved from the mechanism has significantly reduced the cost of inputs resulting in a more profitable yield. Additionally, in Dhundi village, solar irrigation farmers have cancelled their plans of making new borewells in their farmland, saving groundwater by avoiding the exploitation caused by excessive drilling of borewells. In Dhundi village, 4 acres of farmland has also increased under irrigation after solar installation, securing 12 acres of farmland without any negative impact on groundwater.

3. Land Levelling: The project has been successful in implementing the intervention in 145 acres of undulated land benefitting 192 farmers with additional patches of land. 45 acres of new land is now being used for cultivation. Each season the income increased per acre on additional land is Rs. 21000 resulting in prolonged benefit for farmers.

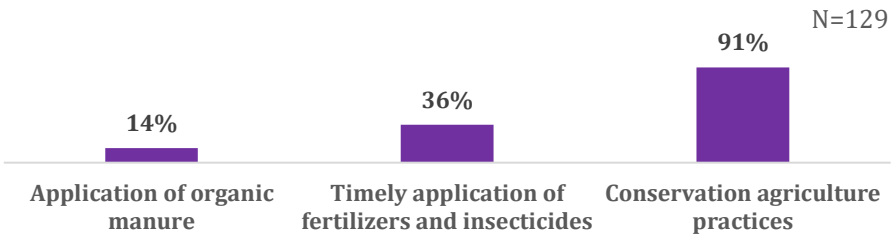
4. Wire Fencing: Wild boars and Bluebucks have been responsible for destroying farmlands and agricultural produce in the intervention villages. The project implemented wire fencing from forests through HRDP interventions aiding the farms closest to the jungle and indirectly helping other farms that accidentally get in the way of the wild animals. Through the interventions, a total 342 acres of farmland of 433 farmers have been benefitted reducing crop loss exponentially.

4.2 Skill Training and Livelihood Enhancement

4.2.1 Access to Agriculture Training and Services

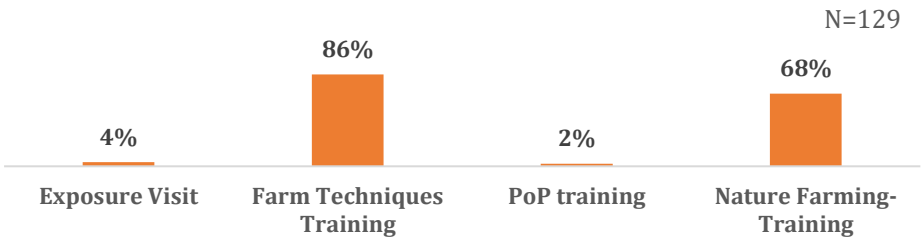
From the surveyed households, 32% people have benefitted from the intervention on agricultural training and support. From the households who benefitted, all households have received support in terms of agricultural training practices.

Figure 11: Percentage of farmers who learnt new agricultural practices



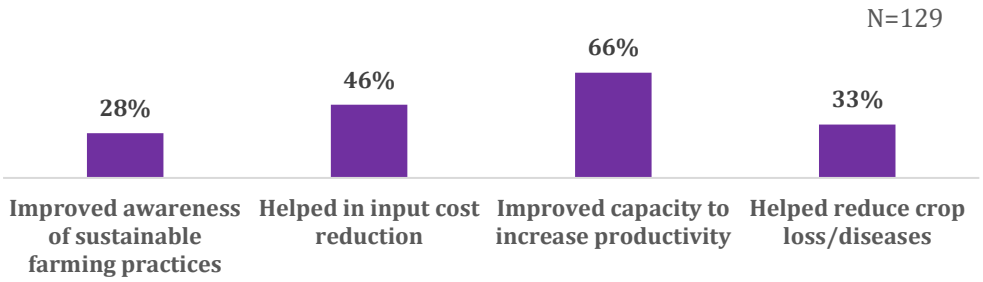
As seen in figure 11, through the HDFC interventions, 91% of households received training on conservation agriculture practices. 36% of households have reported that they learnt the timely application of fertilizers and insecticides and 14% of the respondents received support on application of organic manure. The training involved package of practice training for paddy crop and kharif and rabi pulses support through the above-mentioned activities. 96% of the households learnt these practices through HDFC Bank interventions. In terms of farmers receiving different kinds of training, 86% received farmer technique trainings, 68% received training on nature farming. (Refer to Figure 12)

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



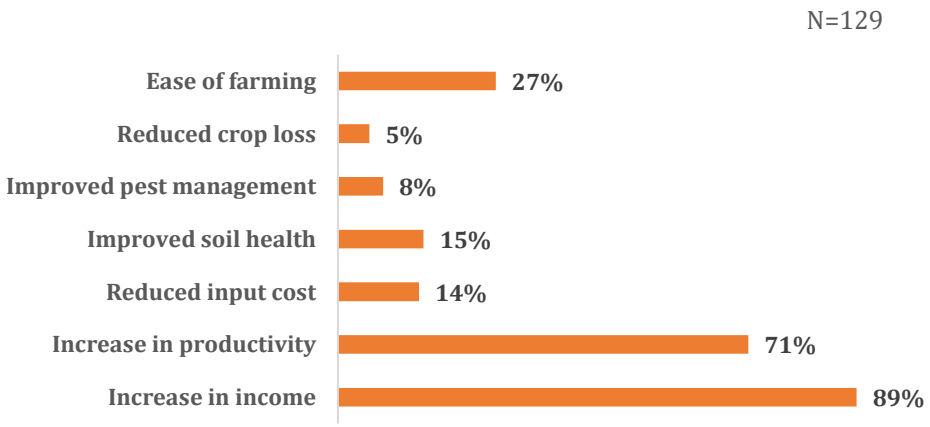
The perceived benefits of these programs have been that it has improved the capacity to increase productivity as reported by 66% of attendees. 46% of beneficiaries reported that the trainings helped reduced input costs, 33% said it helped reduce crop loss/disease and 28% of attendees reported that it improved awareness of sustainable farming practices (Figure 13).

Figure 13: Perceived Benefits of learning agriculture practices



From figure 14 it is implied that, after adopting these techniques, 89% of farmers reported an increase in income followed by 71% reporting an increase in productivity. Since the region mainly suffers from infertile land, use of organic manure has been beneficial to increase the crop cycle and improve soil health (15%). 14% of the respondents have reported a reduction in input cost. The median income increases after adopting these practices has been INR 60,000 per household annually.

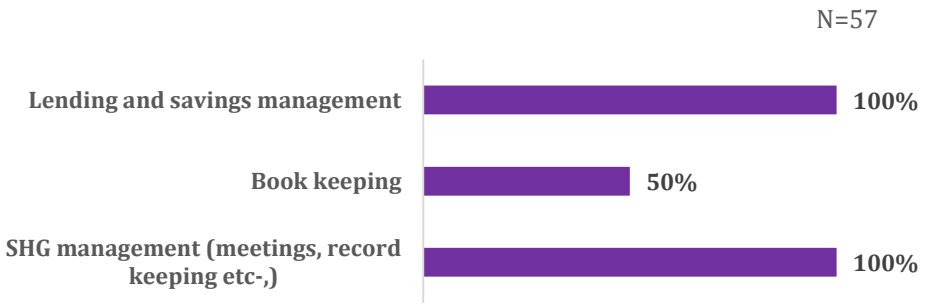
Figure 14: Improvements in farming after adopting the agriculture techniques



4.2.2 Economic Empowerment through Collectivisation

14% of respondents have reported they have benefitted from SHG development. The qualitative study shows that the main support has been provided to existing SHGs by strengthening them through entrepreneurship opportunities such as the distribution of sewing machines to women as support from SHGs. They have been made aware of entrepreneurship opportunities that they could take up and support provided based on consultations with them for the above-mentioned activities. Through the project, 74% of the women mention establishing, reviving, and inducting SHG's to be the primary intervention. 67% of the SHG's are still functional. Mobilization of members (100%) and training on bookkeeping (59%) were the main support provided to previously established SHG's. Additionally, aid was provided to established SHGs to develop the required bank linkages such as joining the program with the pre-existing Mission Mangalam for further enhancement of their activities. The main trainings received as reported by women SHG members are shown in Figure 15:

Figure 15: SHG trainings received as part of project interventions

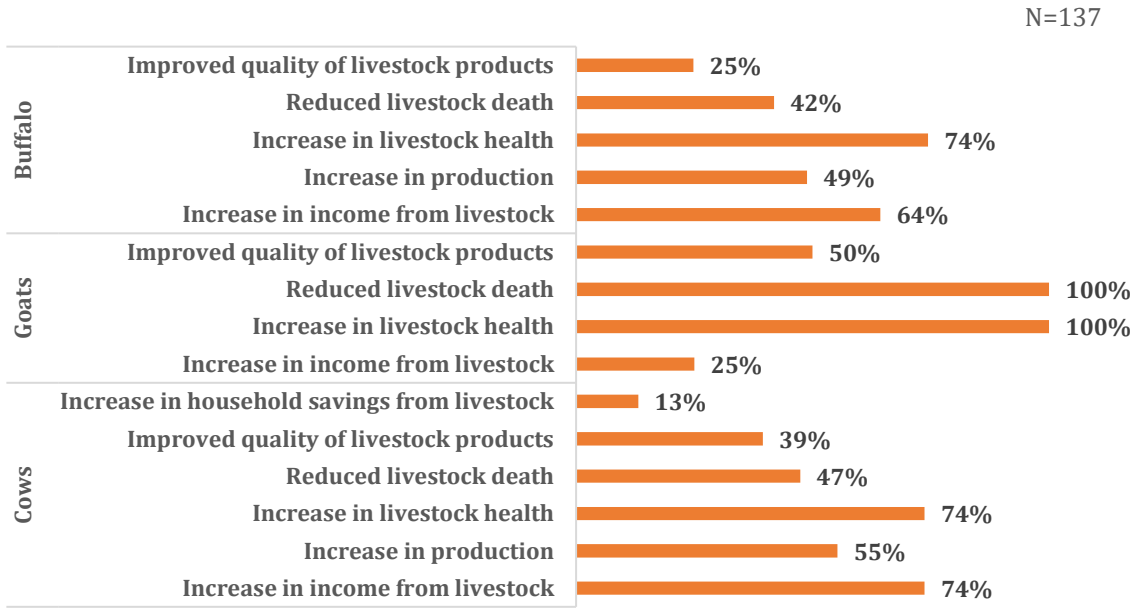


The women show considerable knowledge of the processes and the system that is required to maintain their SHG; they reported that it has aided them in building their confidence and the loan distributed through the SHG and bank linkages have been beneficial in constructing houses, conducting marriages and for internal household purposes. Additionally, the women collectively are seeking out trainings to further advance their SHG from being just for savings to a collective enterprise. The median monthly income from SHGs in the region is INR 1750.

4.2.3 Improved Capacity to Generate Income Through Livestock Management

34% of the respondents have benefitted from interventions in livestock management. The main intervention that the beneficiaries have received is the construction of pucca flooring for cows, buffalos and goats managed by people in the village. The animal shelter has been beneficial as around 80% of the respondents note the increase in livestock health through pucca flooring. During monsoon season, many animals are unable to protect themselves from the insects in the mud and the constant wetness of the floor and were constantly falling sick. The additional cost brunt by the households for health treatment has been significantly reduced. 74% of the respondents with cow as their cattle have noted the increase in income through shed development (see Figure 16 for reference).

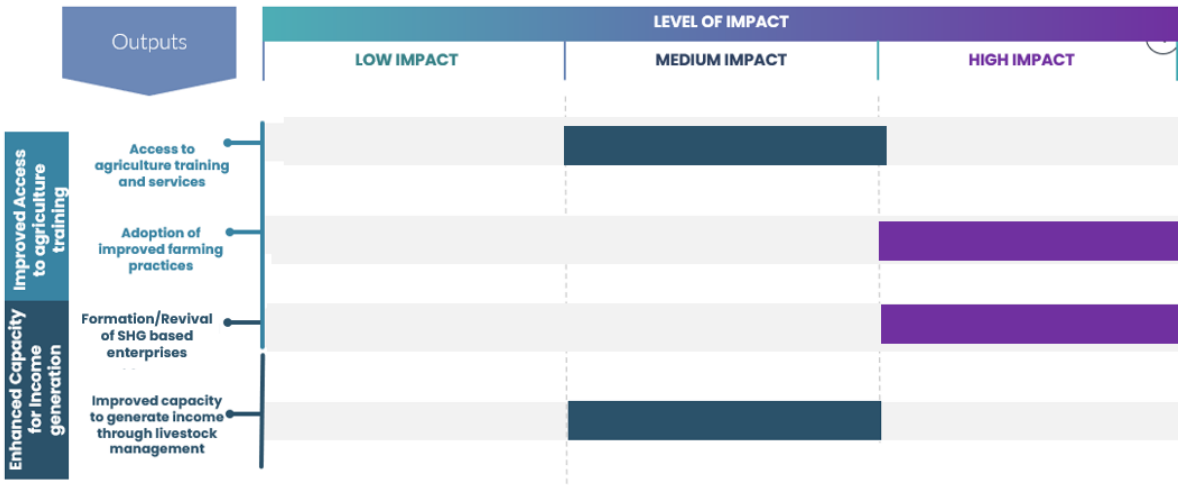
Figure 16: Perceived primary benefits of livestock interventions



On an average 50% of the income generated by households is through livestock management. Thus, the intervention has been beneficial in securing 50% of the household income. The median monthly income from livestock is Rs. 3500 marking a 16% increase from the income before the project.

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, Self-Help Group (SHG) women have greatly benefited from trainings on record-keeping and the regular conduction of routine SHG activities, which they have continued to apply with the support of the project interventions as observed with the high impact

4.2.5 Case Study

Pucca Flooring Interventions

Pucca flooring beneficiary

As evident in the sample findings, 82% of the households are engaged in livestock management. The project interventions in constructing pucca flooring has positively changed the lifestyle and future costs relating to cattle illness. The women in the household note how it has become easier to clean the cattle shed as opposed to before. There is clean and mud free cattle during monsoon season, ease in milking the cattle, and reduction in the wastage of fodder. Women also note the saving of time, by working on the cattle on concrete flooring, it becomes easier for them to do tasks quickly. Improvement in cattle health is one of the most important findings from the intervention on pucca flooring for cattle.

4.3 Health and Sanitation

4.3.1 Health Infrastructure and Services

The program had a component to create health awareness to the people including health camps, that were attended by 48% of the total sample. Of this percentage of beneficiaries, 87% have attended a hygiene related health session, 36% have attended health awareness sessions and 10% have availed health service in the form of health camps that were set up yearly throughout the project duration. 70% of the responses received diagnosis from the health camps and 91% received medication. 100% of the health camp beneficiaries went for the consultation they were referred to through camps. This is mainly because of the active involvement of the Community Recourse Person (CRP) who followed up with the consultations and helped people to travel to nearby hospitals for treatment.

Figure 18: Perceived benefits of HDFC Bank supported health camps/clinics

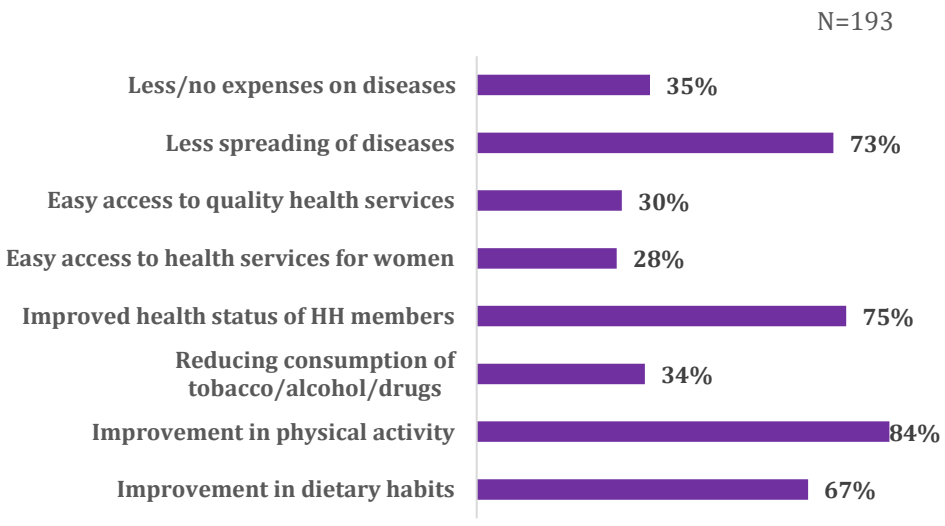


Figure 18 explains the perceived benefits of health camps/clinics according to the respondents. 84% of respondents surveyed stated improvement in physical activity to be the prime benefit of health camp and sessions. 73% mentioned less spreading of diseases and 75% reported improved health status of household. 67% mentioned improved in dietary habits while 35% mentioned less expense on diseases as the benefit. This shows that benefits have aided awareness generation amongst people and enabled access to healthcare, especially for women through routine follow up activities conducted by the CRPs through the project.

4.3.2 Kitchen Garden

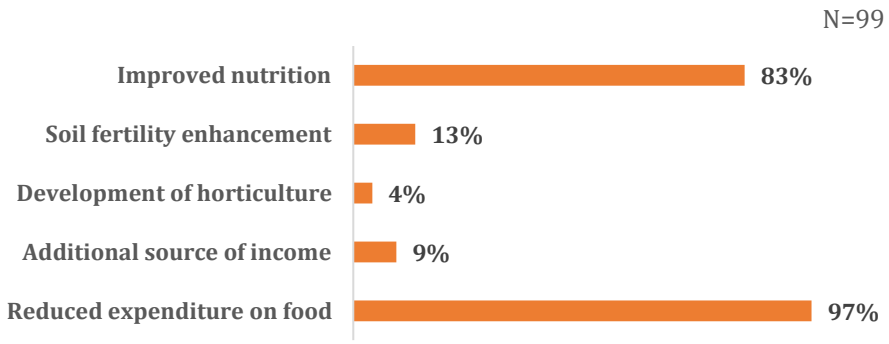
To improve the nutritional status of the community and tackle the problem of malnutrition, especially in ultra-poor households, the project supported the community with kitchen gardens. Out of the total sample, 25% received interventions in kitchen garden out of which 100% of the households' received seeds, 48% households received training on proper management and maintenance, and 30% were shown demonstrations for proper kitchen garden under the intervention. They received support for a variety of vegetables such as brinjal, tomato, beans, spinach, radish, lady finger, coriander, bottle gourd etc.

Majority of the respondents were found using the produce from their gardens for self-consumption (94%), and only 2% 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 1400.

While 60% of the beneficiaries observed a decrease in the amount they spent on fruits/vegetables from the market, 79% 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 2000 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 19.

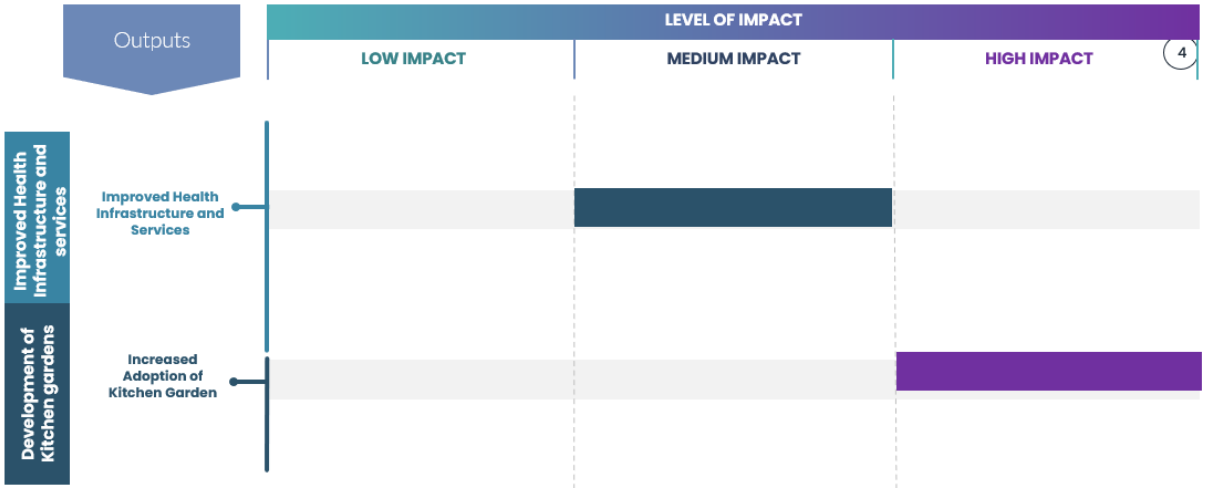
Figure 19: Benefits of kitchen garden as reported by beneficiaries



The chart shows that 97% of the respondents note the reduced expenditure on food and improved nutrition in the household (83%) to be the primary benefits of the kitchen garden intervention. This is followed by 13% of the respondents noting soil fertility enhancement to be the benefit of the intervention. 84% of the respondents have said they are fully satisfied with the intervention.

4.3.3 Impact Observations

Figure 20: Overview of Impact and Effectiveness of Interventions -H&S



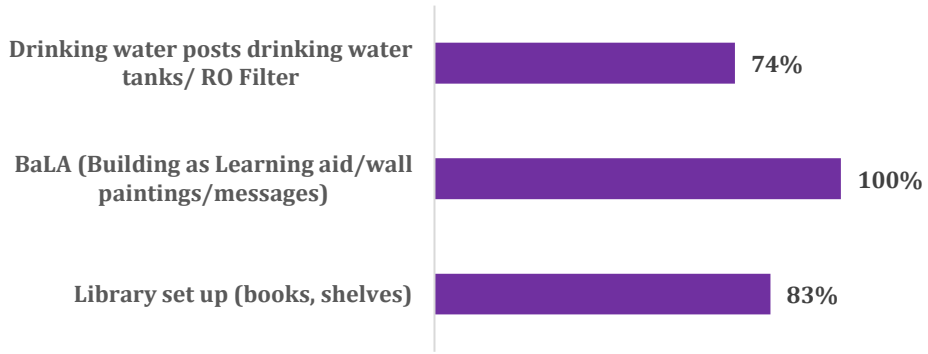
Under H&S, high impact was observed under development of kitchen garden, which was adopted seasonally by many households of the region. The introduction of kitchen garden interventions has proven instrumental in providing nutritious food to households and gaining widespread adoption among families in the project area. Significant impact was also observed in enhancement of health infrastructure through health camps in the region.

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 programme area. The programme focused on equipping schools with infrastructure facilities. 22% of the respondents have reported that their child has benefitted through the interventions in school. Of this percentage, 79% were benefitted through the library set up, 77% through BaLa paintings and 75% by drinking water posts. Figure 21 reports the percentage of teachers who reported different interventions under education in their school.

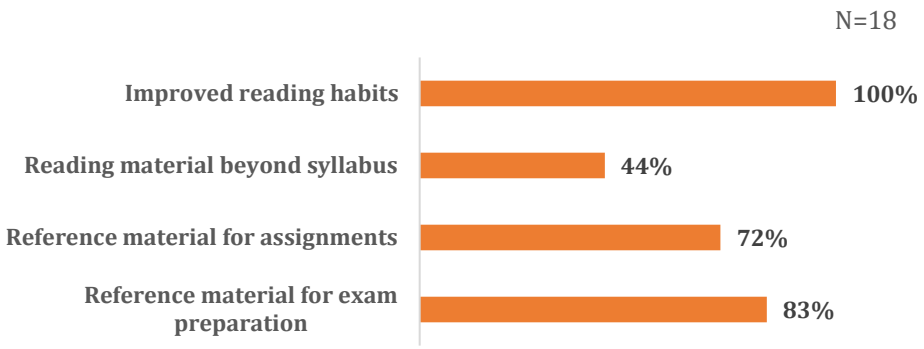
Figure 21: Percentage of teachers who reported different interventions under education in their school



To engage young children in reading and writing, a library shelf along with 300+ books was given to each school in the project villages. This has greatly benefited young students as the difficulty

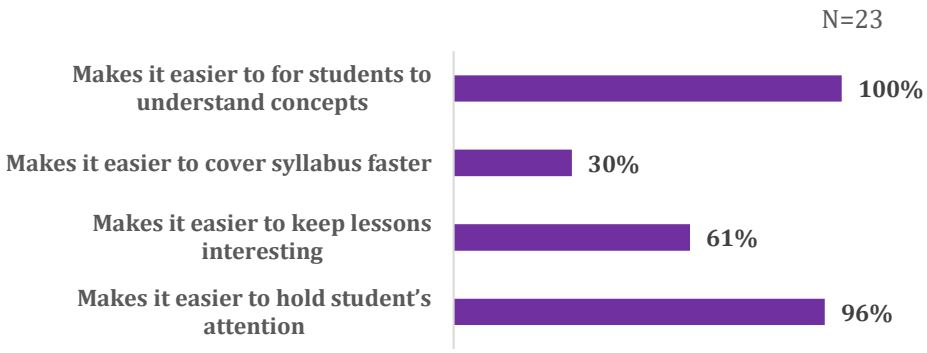
level of the books that are mainly in Gujarati, matched the children's and make for varied types of readings. The library set-up and the rotatory distribution of books are still active in schools. 91% of households report that the library has benefitted children to read materials beyond their syllabus. 74% of the teachers interviewed have stated that they use the library sometimes (once a week). All teachers have noted that the library has made it easier for students to understand concepts. Figure 18 notes the perceived benefit of libraries according to students. As seen from the figure, it is evident that the students find it easier to read variety of literature through the interventions (100%) followed by additional reference material for their exam preparation (83%).

Figure 22: Perceived benefits of libraries according to students



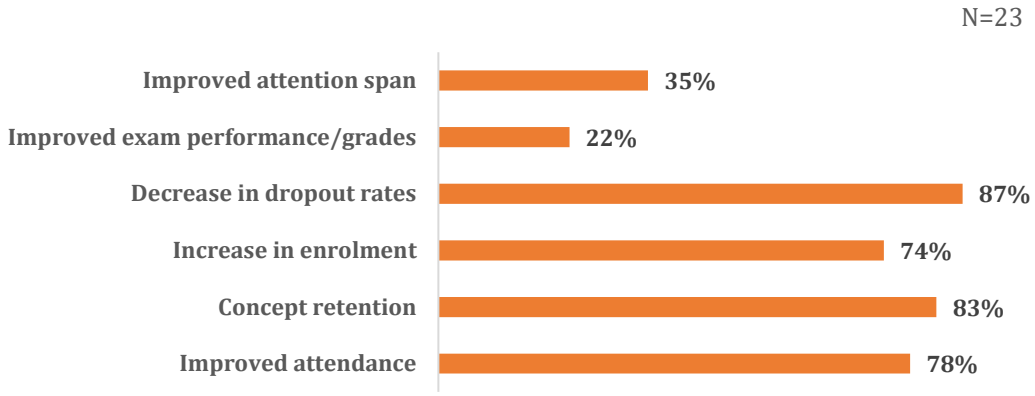
BaLA paintings were also constructed around the school campus. Figure 23 shows the benefits of BaLA paintings according to teachers. From the figure it is evident that BaLA paintings have been beneficial for students to understand concepts better and has improved their ability to pay attention (100% and 96% respectively).

Figure 23: Perceived benefits of BaLa painting according to teachers



Additionally, RO coolers installed in project villages have been efficient in providing safe water for drinking and for children to spend more time in school. 53% of the teachers reported the school drinking facility is fully functional. Figure 24 indicates the perceived benefits of infrastructural interventions according to teachers.

Figure 24: Perceived benefits of infrastructure interventions according to teachers



As evident from the figure, 87% teachers note the decrease in dropout rates through interventions while 83% note the increase in concept retention. Additionally, 78% teachers also attribute increase in attendance because of infrastructural interventions held through HRDP.

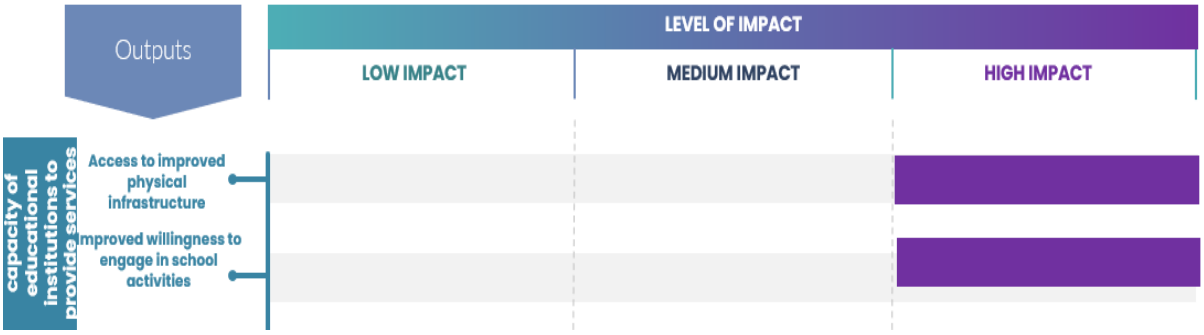
Awareness generation and celebration of events such as Gandhi Jayanti, Toilet Day, World Commons Day etc., were also conducted with the FES team and the school. These helped children understand the importance of common natural resource practices that they can implement in their lives.

While education infrastructure in the form of BaLA, libraries etc., are crucial elements of the learning environment and is known to improve student outcomes, facilitate better instruction and reduce dropout rates, there remains 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 SMC members on the RTE (Right to Education Act) as well as their roles and responsibilities towards school development.

BaLA paintings

4.4.2 Impact Observations

Figure 25: 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. This is due to the sustained interventions that have led to widespread transformations in the project schools.

4.5 Holistic Rural Development Index (HRDI)

There are multiple dimensions involved in achieving the goals 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 P0275 implemented in Kheda has been given in the following table.

Table 8: HRDI Calculation P0275

Domain	NRM		ST&LE		H&S		PoE		Total	
HRDI Score	Baseline	Endline	Baseline	Endline	Baseline	Endline	Baseline	Endline	Baseline	Endline
	0.08	**0.10**	**0.09**	**0.16**	**0.07**	**0.19**	**0.15**	**0.20**	**0.42**	**0.73**
% Change	25%		78 %		171%		33%		74%	

While the overall HRDI has 74% increase over baseline, the impact observed to be high in Health and Sanitation (171%), Skill and Livelihood at 78%, 33% increase in Promotion of Education and 25% for Natural Resource Management.

5 Analysis of Assessment Criteria

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

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

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

5.1 Relevance and Convergence

Kheda district in Gujarat 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, self-help group (SHG)/women development, livestock management and entrepreneurship development under Skill Training and Livelihood Enhancement; educational support under Promotion of Education; health and kitchen garden, under Healthcare and Hygiene.

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 made use of.

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 Key Resource Persons (KRPs) have proven instrumental in effectively managing HDFC funds during the project intervention. As a result, certain project villages have successfully maintained a revolving fund, enabling activities that benefit the entire community, such as gabion construction. The knowledge gained from the community's collective maintenance of resources has been invaluable in sustaining many practices that were not previously implemented.

In the realm of Skill Development and Livelihood Enhancement, farmers continue to actively participate in training sessions on new scientific farming practices, even when the village KRPs are not on the payroll. This proactive approach has facilitated the adoption of environmentally friendly agricultural practices, reducing input costs for farmers. Women involved in Self-Help

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

Group (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 bookkeeping and record maintenance.

As mentioned earlier, 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 educational interventions have proven particularly advantageous in establishing enduring structures that contribute to the sustained attention and well-being of students. Moreover, the provision of drinking water posts has significantly improved the health of 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 Kheda district of Gujarat, 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 products.

6.2 Skill Training and Livelihood Enhancement

- Handholding support to enterprises so they have 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
- More advanced training on production practices and the use of machines/tools for farmers to keep pace with the demands of the market.
- 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.
- The sensitisation programmes on health issues and menstrual hygiene should be conducted in periodic manner and not at one time.
- Expanding the coverage of piped water supply to villages as there is a problem of safe and accessible drinking water.

6.4 Promotion of Education

- The scaling up of learning and 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 Thasara and Galteshwar blocks of Kheda district, Gujarat, led by the Foundation for Ecological Security (FES) across 10 villages, had a multi-faceted approach. It encompassed Natural Resource Management (NRM) interventions, including fencing and irrigation, resulting in a 20% increase in gross income and 40% 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 and kitchen garden training, improved physical well-being and reduced food expenses. Promotion of Education initiatives, including 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 nine villages acted as the sampling frame for the programme. This list was obtained from the implementing partner – SM Sehgal Foundation. 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 HRDI Methodology

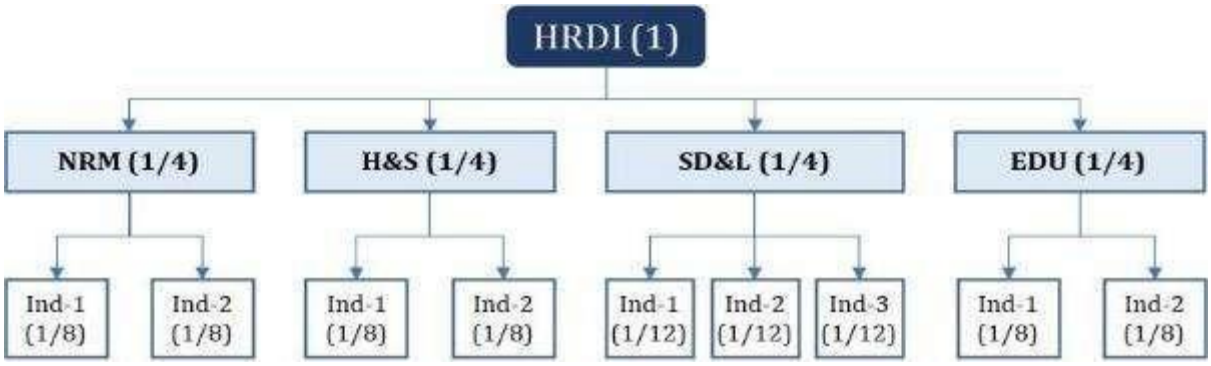
The outcome indicators included in the HRDI were obtained from different domains and are consequently measured on different scales. Therefore, to ensure the comparability of these indicators, all the indicators were converted into discrete variables such that the indicators could be measured between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

B.1 Indicator Weights

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

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

Figure 26: 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.

B.2 Analysis Plan

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

B.3 Method to Calculate HRDI

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

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

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

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

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

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

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

The calculation for Kheda has been detailed below (see Table).

Table 10: HRDI Calculation for Kheda

Domain	Indicators	Baseline	HRDI	End line	HRDI	% Change
NRM	Proportion of farmers with net income above median	0.16	0.08	0.21	0.10	25%
	Proportion of farmers reporting increased productivity of three main crops above median (before and after)	0.08		0.11		

Domain	Indicators	Baseline	HRDI	End line	HRDI	% Change
	Percentage of farmers reporting access to irrigation	0.08		0.08		
ST&LE	Percentage of SHG members reporting income above median from rural enterprises	0.08	0.07	0.47	0.19	78%
	Percentage of HH reporting income above median from livestock	0.18		0.30		
H&S	Percentage of households reporting increase in use of fruits/vegetables from the nutrition garden	0.51	0.13	0.96	0.24	171%
PoE	Percentage of respondents reporting increased access to functional school physical infrastructure (drinking water posts, separate washrooms, furniture etc.)	0.22	0.15	0.12	0.20	33%
	Percentage of respondents reporting increased access to functional learning infrastructure (library, science labs, smart class, etc.)	0.37		0.41		
Total			**0.42**		**0.73**	**74%**

C 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
NA. Increased income from agriculture				
Land/ crop productivity	Proportion of farmers reporting increase in production of crops that were supported under HRDP	84%	53%	Medium
	Proportion of farmers reporting increased income from crops that were supported under HRDP	82%		
	Average increase in productivity from crops that were supported under HRDP (% change)	32%		
	Average decrease in input cost (% change)	14%		
Access to the farm management infrastructure	Proportion of beneficiaries satisfied with the quality of available services (in farm management)	90%	59%	Medium
	Proportion of farmers reporting training intervention for natural fertilizers	32%		
	The proportion of farmers reporting an increase in the use of natural fertilizers	56%		
Land under irrigation	Proportion of farmers having irrigated land	18%	10%	Low
	Proportion of farmers who adopted horticulture/floriculture	2%		
Improved access to agricultural training and services				
Access to Agriculture training and services	Proportion of farmers who accessed project training services	32%	60%	Medium
	Proportion of farmers who demonstrate awareness regarding sustainable farming practices	87%		
Adoption of improved farming practices	Proportion of farmers who adopt scientific agricultural practices	88%	81%	High
	Proportion of beneficiaries reporting an increase in productivity due to better farm management	70%		
	Proportion of farmers reporting increased income	87%		
Enhanced capacity for regular income generation				
Formation/ revival of SHG-based Enterprises	Proportion of members who received support with establishing/reviving SHGs	74%	70%	High
	Proportion of members whose SHGs are currently functioning	67%		

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	35%	66%	Medium
	Proportion of beneficiaries reporting a reduction in livestock death	80%		
	Proportion of beneficiaries reporting increase in livestock health	84%		
Improved health infrastructure and services				
Establishment/ enhancement of health infrastructure and services	Proportion of beneficiaries who gained access to health services	48%	66%	Medium
	Proportion of beneficiaries reporting improvement in physical activity	84%		
Development of kitchen gardens				
Increased adoption of kitchen gardens	Proportion of HHs reporting improved nutrition from kitchen gardens	83%	91%	High
	No of HHs received seeds/training in kitchen garden	100%		
	No of HHs with reduced expenditure	97%		
	Proportion of HHs reporting fully satisfied of the intervention	84%		
Improved capacity of educational institutions to provide services				
Access to improved physical infrastructure	Proportion of teachers who report gaining access to functioning libraries, toilets, water posts	100%	91%	High
	Proportion of students who gained access to clean and functioning sanitation units/drinking water posts at education institutions	83%		
Improved willingness to engage in school activities	Teachers reporting improvements in attendance due to improved infrastructure	78%	50%	Medium
	Proportion of teachers reporting an increase in enrolment post infrastructure development	74%		
	Proportion of teachers reporting a decrease in dropout rates post infrastructure development	87%		

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

D Two Sample Proportions Z Test

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

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

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

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

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

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

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

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

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

Assumptions:

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

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

Table 12: Z-tests Conducted for P0275

Indicator 1	Proportion of farmers with income from agriculture above baseline median
p1 (proportion of first sample-endline)	63

n1 (sample size of p1)	360
p2 (proportion of second sample-baseline)	49
n2 (sample size of p2)	360
p	0.155555556
Calculation	0.027014196
z statistic	5.182460298
	Statistically significant at 95% confidence level (or p<0.05)
p-value for the z statistic	0.00001

Indicator 2	Percentage of HH reporting income above median from livestock
p1 (proportion of first sample-endline)	60
n1 (sample size of p1)	137
p2 (proportion of second sample-baseline)	37
n2 (sample size of p2)	137
p	0.354014599
Calculation	0.057779882
z statistic	3.980624249
	Statistically significant at 95% confidence level (or p<0.05)
p-value for the z statistic	0.000069

E Theme-wise Sustainability Matrix

The programme support provided demonstrated the capability to continue even after the programme ended. The programme's support to sustain improved outcomes are enumerated below (see Table 13).

Table 13: Theme-wise Sustainability Matrix

Support Provided	Structures Established	Technical Know-how	Usage	Maintenance
NRM				
Irrigation Management	✓		✓	
Farm Management	✓		✓	
ST&LE				
Agriculture Training and Support		✓	✓	
SHG Development		✓		
Livestock Management	✓	✓	✓	
H&S				
Health		✓		
Kitchen Garden	✓	✓	✓	✓
PoE				
Educational Institutions Development	✓	✓	✓	✓
Awareness Generation				