Impact Assessment Study under Holistic Rural Development Programme (HRDP) Madhya Pradesh– P0311

HDFC Bank CSR

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Executive Summary

The HDFC Bank supported Arpan Seva Sansthan in implementing Holistic Rural Development Program (HRDP) in 10 villages across the Lateri block of Vidisha District, Madhya Pradesh, between 2020 and 2023. After the completion of the project, Intellecap conducted an impact assessment of the various interventions undertaken in the project.

The impact assessment methodology was developed in order to evaluate the performance and effectiveness of the project's interventions and activities, socioeconomic changes among the beneficiary households, income, and promotion of community-based institutions for the project sustainability. To evaluate the project's results and impact, a mixed-methods approach was adopted integrating qualitative and quantitative data collection and analysis. Retrospective recall was used to record the pre- and post-project outcomes, providing insights into how the project indicators changed over the baseline. The samples for the study were chosen using stratified random sampling and the PPS (Probability Proportional to Size) method. The assessment covered 9 villages, 413 household interviews, 3 In-Depth Interviews (IDIs), 3 Key Informant Interviews (KIIs), and 8 Focus Group Discussions (FGDs). This comprehensive research design enabled a thorough evaluation of the project's impact, learning, and recommendations for future interventions. This report presents the outcomes of interventions focused on Natural Resource Management (NRM), skill training, livelihood enhancement, health and sanitation, and education promotion in the Lateri block of Vidisha district of MP.

Natural Resource Management (NRM)

Under NRM, activities implemented in the project area encompassed irrigation, water management, and farm management, including the construction of farm and community ponds, pond desilting, well improvement, stop dams, solar-powered streetlights and drinking water systems. These interventions led to significant improvement, with the **median net income doubling from Rs. 25,000 to Rs. 50,000**, and **mean wheat production** in Lateri, Vidisha increasing from **2,801 kg to 3,683 kg**. The **median average productivity of wheat rose by 36 percent**, while **crop diversification was encouraged,** with coriander emerging as a primary crop. Notably, **95 percent of respondents reported increased income due to crop changes**. Clean energy interventions, such as solar water pumps, improved access to clean drinking water and solar streetlights for a small percentage of respondents, contributed to overall community development.

Health and Sanitation (H&S)

In the health and sanitation sector, Arpan Seva Sansthan successfully **implemented kitchen garden** initiatives across the 10 project villages, that gained widespread acceptance. The **program provided various resources to beneficiaries, including seeds (97%), training (82%), demonstrations (24%), and fertilizers/pesticides (15%).** This comprehensive approach enhanced participants' gardening skills and **reduced their weekly expenses on fruits and vegetables.** Notably, over **52 percent of the participants reported an average weekly savings of Rs. 400**, demonstrating the initiative's significant impact on household economics and nutritional self-sufficiency.

Skill Training and Livelihood Enhancement (ST&LE)

The project's focus on skill training and livelihood enhancement included initiatives such as **farm field schools, exposure visits, and training on vermi-pits to promote sustainable agriculture.** The trainings increased awareness of practices such as organic manure application and conservation agriculture, with sustained adoption post-program. Quantitative data shows positive outcomes: **over 89% of respondents experienced increased crop productivity, 93% reported income growth, 60% report a reduction in input costs, 26% perceive an improvement in soil health, 27% report reduction in crop loss, and 19% have benefited from enhanced pest management.** While HDFC's support for SHG development was limited due to the presence of only a few functioning SHGs in the area, they established moderately successful enterprises for some groups. Livestock management interventions, primarily **goat provision, benefited about 10% of respondents**, with beneficiaries reporting **healthy goats, reduced livestock mortality, increased income, and a 60% increase in median monthly income from livestock.**

Promotion of Education (PoE)

Under education, interventions included installing drinking water posts, implementing BaLA paintings, setting up smart classes, providing sports equipment, and constructing separate washrooms for boys and girls. These initiatives have been well-received, with all students reporting frequent use of the new facilities. The **availability of safe drinking water has led to a perceived decrease in health issues and increased time spent at school.** Students **universally enjoy using smart classes and are finding the lessons more interesting (55%), easier to understand (44%), and easier to remember (22%).** The separate washrooms for boys and girls have positively impacted attendance, with all students reporting they can now spend more time in school and attend regularly. These interventions have collectively enhanced the learning environment and improved student engagement and attendance.

Table 1: Summary of Key Impact Indicators

Indicators (based on median)	Before	After	% Change
Increase in average productivity (of three major crops) (quintal/acre)	6.55	8.95	37%
Increase in average median net annual income from agriculture	INR 25,000	INR 50,000	100%
Monthly income from SHG business activity	INR 2384	INR 3649	53%
Monthly income from job/skill (income from enterprises)	N/A	N/A	N/A

Two of the four key impact indicators have been mentioned here as enterprises were established as part of SHGs and no employment-oriented skill training were included in the project design.

HRDI Indicators

The impact of the project was assessed on Holistic Rural Development Index (HRDI), which is a weighted index that gives an index value for each focus area and for the entire project.

The thematic-wise indicators were assigned weights to arrive at the composite **HRDI score of 0.60, indicating a notable positive change of 55 percent toward the desired impact from the baseline score of 0.39.**

The high percentage change in ST&LE can be attributed to the low baseline score and the extensive work done in this thematic area.

Findings showed an improvement in all focus areas, as shown below:

Table 2: Summary of HRDI Scores

Domain	NRM		ST&LE		H&S		PoE		Total	
HRDI Score	Base line	End line	Base line	End line	Base line	End line	Baseline	Endline	Baseline	Endline
	0.07	**0.11**	**0.07**	**0.11**	**0.05**	**0.12**	**0.19**	**0.25**	**0.39**	**0.60**
%Change	**57%**		**47%**		**127%**		**35%**		**55%**	

Recommendations

Recommendations for project initiatives:

- It is recommended to increase adaption and sustainability of farming practices; the implementing partner may ensure that farmers adhere to the agricultural techniques that have been taught and support follow-up visits with farmers. Experts in agriculture should preferably be invited for such visits (ideally from Krishi Vigyan Kendra (KVK)).
- It is advised that to empower farmers, the project can focus on value-added processing, such as setting up small-scale processing units specifically for crops like coriander. Farmers can be offered training on value-added processing techniques and quality control measures. Additionally, to help them reach wider markets, support can be provided in developing new products from their crops (such as dalia from wheat), along with packaging and branding assistance.
- Establish demonstration plots to showcase the benefits of crop diversification. Use these plots to conduct trials and gather data on new crop varieties that can be scaled up in the area. Provide financial support for purchasing seeds and few other inputs for new crops.
- Train community members in basic maintenance and repair of solar streetlights and water pumps to ensure longevity and functionality. Explore additional clean energy solutions such as solar-powered irrigation systems and energy-efficient farming equipment to reduce dependency on non-renewable energy sources.
- It is advised that under H&S the project interventions in such areas focus more on supporting primary health Care, or animal care as these interventions can prove to be more more beneficial considering the fact that the people of these villages have to travel for more than 30 kilometres to reach the nearest hospital.
- Revival of SHGs is crucial in this region. Women are hardly involved in decision-making of their houses or their villages because of the conservative approach of the community as a whole. Revival of SHGs can uplift women further and bring about a change in their approach and give them more confidence to be more involved in the village development activities.
- Training for relevant skills that could support in employment could be undertaken. Further, creating employer-employee linkage can also aid in better employment opportunities, especially to the youth.

- Extending the project's duration from three to five years can aid in better programme implementation and maintenance.

1 Introduction

Over the years, India has made enormous strides in rural development. While 65% of the country's population lives in rural areas (as of 2021), nearly half, or 47%, is still dependent on agriculture for a living (PIB Delhi, 2023). The rural ecosystem has grown by around 10% per year over the last five years, but it is still plagued by numerous issues, such as a lack of irrigation, deteriorating soil health, disguised unemployment, fewer skill development opportunities, unreliable healthcare availability, low literacy rates, and increasing environmental degradation, among others. To address these diverse yet interconnected developmental challenges, the HDFC Bank, through its Corporate Social Responsibility (CSR) initiative 'Parivartan,' supports several projects that provide holistic rural development to help the rural population grow and prosper.

1.1 About HRDP

The goal of these initiatives is to promote sustainable socioeconomic and ecological development in order to guarantee the development of prosperous and content communities. The program's all-encompassing approach meets the needs of the communities by providing essential inputs on matters like fostering economic independence through opportunities for skill development and livelihoods, delivering fundamental infrastructural development, and creating a better ecosystem that fosters better living conditions. It intends to bring about a socioeconomic transformation in the lives of the rural community by concentrating on the development of human capital, the management of natural resources, and infrastructure in poor and backward villages.

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

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

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

1.2 Objectives of Impact Assessment

The impact assessment aims at understanding:

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

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

The study seeks to:

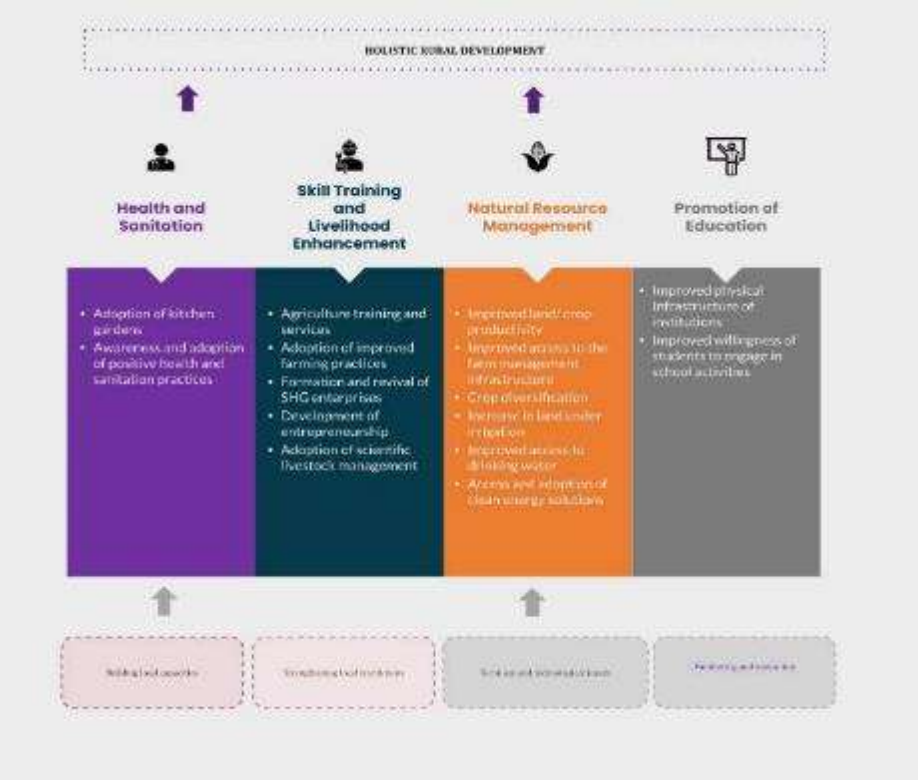
- Critically and objectively evaluate implementation and performance
- Determine reasons for certain outcomes or lack thereof
- Derive lessons learned and good practices
- Provide evidence-based findings to inform future operational and strategic decisions while planning and funding partner organisations

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

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 input and conducting evaluations across the four thematic areas. The objectives under NRM, ST&LE, H&S and PoE are enumerated in the figure below.

Figure 1: Conceptual Framework of Implementation



1.4 About the Project Area

The villages of Lateri Block, Vidisha District, face several critical challenges that necessitate an integrated development project to improve livelihoods and quality of life for the communities. Despite being situated on the Vindhyachal Plateau, which receives over 800 mm of annual rainfall, the undulating terrain with rolling hills and high drainage density leads to acute water scarcity for drinking and irrigation needs. The natural topography and drainage patterns do, however,

provide great potential for implementing water harvesting structures across the rivers and rivulets to capture the substantial rainfall and runoff.

Agriculture is the primary livelihood activity, but rain-fed farming is unable to meet the communities' requirements due to erratic and unreliable rainfall patterns compounded by recurring droughts. With low average landholdings of a mere 1.5 acres per household, rain-fed crop production is woefully inadequate. Improving irrigation facilities is therefore critical to boosting agricultural productivity and incomes.

Moreover, a majority of the population (80-85%) belongs to the Other Backward Classes community, while 15-20% are from Scheduled Caste and Scheduled Tribe communities. All segments across these villages lack access to resources and opportunities for sustainable livelihoods.

The interventions are based on the necessity of the community, after consulting with the village council. Along with clean energy, the HRDP promoted the management of farms and water resources as part of natural resource management. Under "Skill Training and Livelihood Enhancement," "Promotion of Education," "Health and Sanitation," and "Healthcare and Hygiene," the project also focused on agriculture training and support, self-help group (SHG)/women development, skill training, livestock management, and entrepreneurship development. (See Figure 2)

Figure 2: Areas covered under the study (map depicting areas covered under the study)

1.5 Partner Organisation – Arpan Seva Sansthan

Arpan Seva Sansthan is a non-profit organization that has been working on sustainable integrated development initiatives since its formation in 1996 by a team of young agricultural professionals. Their purpose was to ensure rural communities have access to secured livelihood opportunities by bridging the technological, knowledge, infrastructural, and market gaps they face. Under the leadership of Dr. Subh Karan Singh, the organization has grown from 20 to over 500 team members dedicated to sustainable development. With an initial focus on natural resource management, capacity building training, and institutional development, Arpan Seva Sansthan later expanded its initiatives to include livelihoods, drinking water security, sanitation, health and education. Now working with over a million rural families, the organization builds partnerships with communities, local governments, and corporate social responsibility partners to ensure

sustainable development for rural areas. With support from partners and its team, Arpan Seva Sansthan strives towards its goal of enabling sustainable development for rural communities[1].

1.6 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 Arpan Seva Sansthan.

1.7 Criteria for Assessment

For each thematic area, activities completed by Arpan Seva Sansthan were identified. The impact of these activities was assessed using the following criteria:

- Relevance and Convergence
- Impact and Effectiveness
- Sustainability

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

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

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

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

1.8 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 project beneficiaries, and the Arpan Seva Sansthan team. The outcome mapping and result chain development were undertaken in consultation with the HDFC Bank team. Standardised key outcomes and indicators were identified for each thematic area (NRM, ST&LE, H&S and PoE). Based on the standardized list of outcomes and outputs, the questionnaire was developed. The details of the qualitative and quantitative data collection events are given in the next section.

[1] From Arpan Seva Sansthan website

Figure 3: An FGD of Farmer Beneficiaries in Progress

Secondary data sources included HDFC's CSR Policy, Programme Log Frame (Logical Framework Analysis), Quarterly Progress reports, Project implementation timelines, Communication, and Documentation products, and other relevant reports/literature related to the project.

1.9 Sample Size and Distribution

From the 10 villages in the Lateri block where the project was implemented, all the villages were selected for the study. The beneficiaries were selected using purposive random sampling from a list of beneficiaries obtained from Arpan Seva Sansthan. Since beneficiary selection was undertaken independently for each thematic area, the selection of more than one beneficiary from a single household was probable. In addition to this, there were instances where a single beneficiary received multiple benefits and support across the four thematic areas. The inclusion of beneficiaries from all the thematic areas was ensured. The target sample size across ten villages was 400, however, 413 sample respondents were reached. The thematic area-wise sample covered was as follows (see Table 3, Table 4).

Table 3: Quantitative Sample Covered

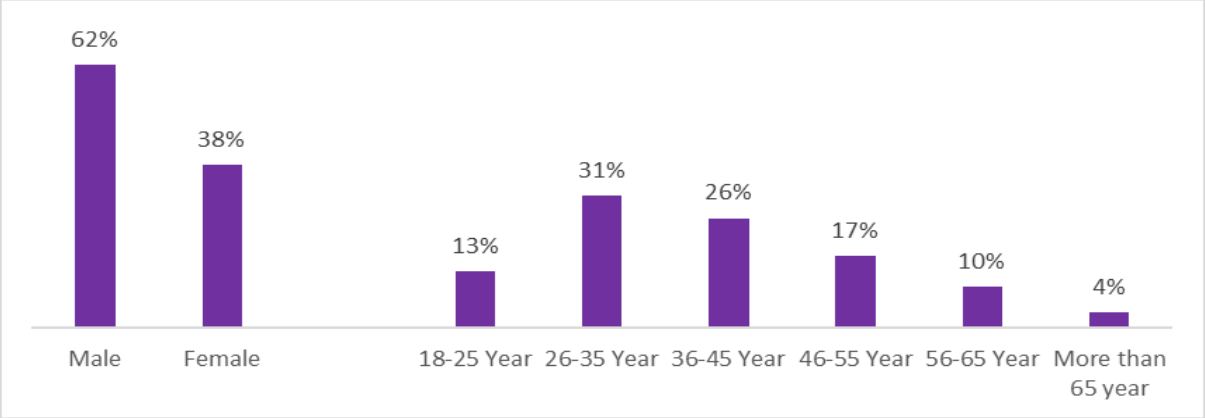
Village Name	Total Households	NRM	Skill Training and Livelihood Enhancement	Health and Sanitation	Promotion of Education
Barkheda	66	39	30	27	6
Jhukar Jogi	69	39	37	24	6
Nagori	42	32	16	25	1
Kherkhedi	17	8	10	6	2
Tiloni	62	32	34	26	12
Ranidhar	39	25	19	26	8
Semri Ahir	22	15	15	15	3
Agra Pathar	47	35	23	34	12
Muskura	39	27	14	31	6
Tonka	10	10	0	2	1

Table 4: Qualitative Sample Size Covered

District	FGDs: 10			IDIs and KIIS: 5		
	VDC	*Community*	*Headmaster/ School teacher*	*Village Head*	*Micro enterprise*	*Implementing Partner*
Barkheda	2	3				1
Nagori		1				
Ranidhar		1				

Agra Pathar		1				
Jhukar Jogi		2	1		1	
Muskara		1				
Semri Ahir		1				
Total	2	10	1		1	1
Planned	2	10	1		1	1

Figure 4: Gender-wise and age-wise distribution of the sample (n=413)



Lateri block (rural) has a sex ratio of 886 to 1000 (2011 India Census), against a state average of 931. This is reflected in the number of beneficiaries in this area, as the proportion of **women reached significantly lower levels (38%) as compared to men (62%). The youth population (18-45 years)** constituted the majority of beneficiaries **(70%).** The more older age group **(above 45 years of age) constituted about 30 percent** of the respondents.

The quantitative and qualitative sampling methodology have been explained in detail (see page 38).

1.10 Training of Enumerators

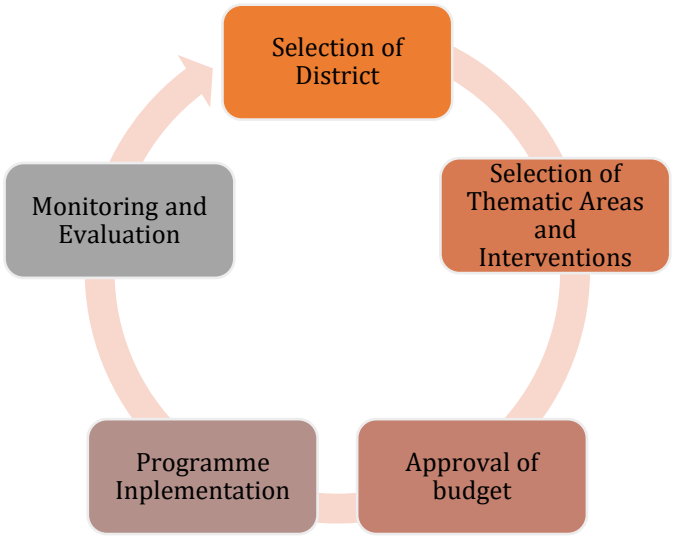
A team of local enumerators, with the requisite education and experience was hired for data collection. Two days of training in Biaora were provided to enumerators and supervisors by the Intellecap team.

Figure 5: Training of enumerators

2 Review of Project Planning and Implementation

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

Figure 6: Planning and Implementation Process



2.1 Selection of Project Area

The villages of Lateri Block in Vidisha District face acute challenges necessitating an integrated development project. Despite receiving over 800mm of annual rainfall, the undulating terrain with rolling hills and high drainage density causes water scarcity for drinking and irrigation, though the topography enables potential for water harvesting across rivers and rivulets. Agriculture is the primary livelihood, but rain-fed farming fails to meet requirements due to erratic rainfall, droughts, and low average landholdings of just 1.5 acres per household, necessitating improved irrigation facilities. Moreover, the majority (80-85%) belongs to the Other Backward Classes community, while 15-20% are Scheduled Castes and Tribes, with all segments lacking access to resources and sustainable livelihood opportunities.

The project by HDFC Bank and Arpan Seva Sansthan aimed to address these issues through a holistic and integrated approach. The project focuses on empowering communities in five sectors: livelihoods, agriculture and natural resource management, health and sanitation, education, and financial literacy. The selected panchayats in the backward villages of Lateri were strategically chosen for the project based on their socio-economic criteria and proximity to operations. Through this integrated development approach, the project seeks to uplift the communities and bridge the basic development gap in the region, aiming for sustainable growth and improvement in human development indicators.

2.2 Selection of Thematic Areas and Interventions

Considering the above challenges in the area, HRDP interventions focused on promoting water and farm management in addition to clean energy. The project also focused on agricultural training and support, skill training, livestock management, and entrepreneurship development under ST&LE; educational institution development and education support under PoE; health awareness and sanitation practices under H&S. The activities specific to each village under the project 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 5).

Table 5: Activities under Four Thematic Areas in Lateri, Vidisha

Activity Category	Activities	Output Indicators
NRM		
Irrigation Management	Construction of farm pond, earthen pond construction, pond desiltation, well deepening and repair	Income from agriculture
Water management-agriculture	Stop dams	
Farm Management	Multi-tier cropping system	
Clean Energy	Solar street lights, Solar drinking water supply	Clean energy
ST&LE		
Agriculture Training and Support	Crop demonstration, vegetable demonstration, fodder crop demonstration, Farm field school, exposure visit, Construction of vermi-compost pits, azolla cultivation	Access to Agriculture Training and Services
SHG-Based Women Empowerment	Capacity building of SHG provision of small business	Skill and Entrepreneurship Development
Entrepreneurship Development	Masala making unit, *dona pattal* making machine, sewing machine units	
Livestock management	Goatry unit	Livestock Management
H&S		
Health	-	Health Infrastructure and Services
Sanitation	soak pit construction near handpump	Sanitation Infrastructure and Services
Kitchen Garden	Seeds, training, demonstrations	Kitchen Garden
PoE		
Educational Institutions Development	School building renovation, BaLA, drinking water posts/RO filters, Smart class, toilet renovation, sports material	Infrastructure in Educational Institutions

Each category has been further broken down into sub-categories and activities, along with the focus beneficiary types.

2.3 Project Implementation

The interventions comprised a combination of providing direct materials, and services such as seeds and sprinklers, as farm inputs and implements, along with raising awareness about new agricultural techniques. The program's interventions are chosen on an annual basis, and a budget is allocated each year based on a request made to HDFC Bank by Arpan Seva Sansthan. The field team has had extensive conversations with the village committees to study the issues and

limitations in the communities based on our interactions with the partner team. Activities and interventions were developed and put together based on their needs.

The HRDP started with the hiring of personnel and Community Resource Persons (CRPs) and the delivery of capacity-building trainings on a variety of topics, including the HRDP's goals, roles, and responsibilities. To determine the most pressing problems and requirements of the communities, the project held Gram Sabha meetings and Participatory Rural Appraisals (PRA) in the eight villages. The identified needs were used to create plans and budgets that complemented HRDP's objectives.

The guidance and support that Arpan Seva Sansthan staff provided to all parties was essential in enabling the timely implementation of activities. They efficiently generated reports, made frequent site inspections, received input, and tracked progress.

2.4 Monitoring and Evaluation

The implementing partners used a standard monitoring and evaluation approach for the HRDP. These include reporting on project execution status to the HDFC Bank on a regular basis. Furthermore, the HDFC Bank's programme implementation staff visited the project communities at regular intervals to review the project work sites, participated in training programmes and awareness workshops, and connected with project recipients.

HDFC Bank has specific requests for project information from the implementing partner. The implementing partner manages the project data mostly in spreadsheets, which include information of the village-level activities conducted, beneficiaries mapped against each of the project activities, expenditures, and so on. In addition, the implementing partner submits to HDFC Bank a yearly progress report on project activities, as well as a strategy for the following year. This document is the primary source of information, providing an overview of the actions carried out, outputs produced, and outcomes attained.

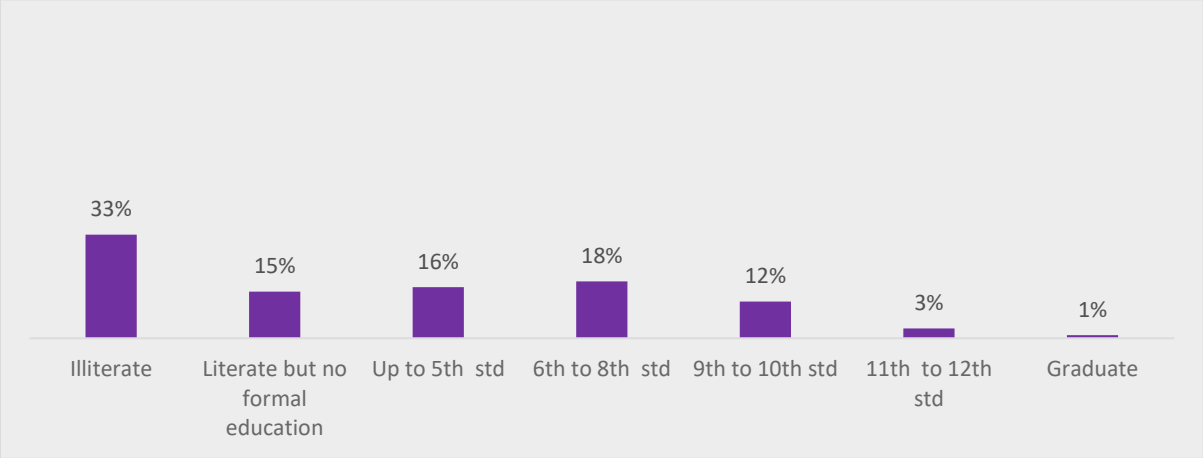
The impact of Arpan Seva Sansthan activities was evaluated using four criteria: relevance and convergence, impact and effectiveness, sustainability, and replicability. This is backed up by the creation of a Holistic Rural Development Index based on selected indicators. The impact (Table 11) of each activity has also been calculated and classified as high, medium, or low impact. The annexure goes into greater detail on these.

3 Study Findings

This section provides an analysis of the profiles of the respondents covered in the ten villages of Lateri block of Vidisha district in Madhya Pradesh.

Figure 7: Income Sources of the Respondents (n=413)

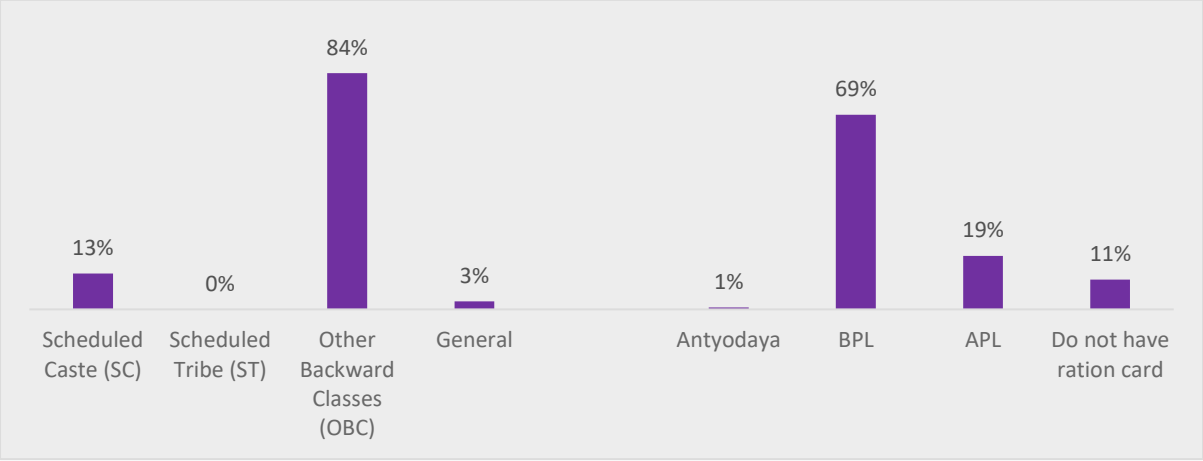
Figure 8: Education status of the respondents (n=413)



The income received by the majority of the participants is derived from agriculture, accounting for 84 percent, while 50 percent of the participants are engaged in wage labour. Additionally, 22 percent of the respondents reported income from livestock. Other sources of income are comparatively less common. Close to **55 percent of the workforce in Madhya Pradesh is engaged in agriculture**, higher than the average of 47 percent in the country. The effective literacy rate in Lateri is 50 percent (2011 India Census), lower than the national average of 59.5 percent, **with 66 percent of males being literate, and only 45 percent of females being literate**[2]. About **33 percent of the respondents were illiterate**, and around 15 percent were literate but had no formal education. **More women were illiterate than men**, and **close to 69 percent of the women have never received schooling**. During the field visit, it was also observed that the rural population of this district was more on the conservative side, with women still following the *purdah* system.

[2] District Census Handbook: Vidisha

Figure 9: Socio-economic Status of the Household (n=413)



In the study area, **around 69 percent of the respondents hold BPL cards, while 19 percent hold APL cards.** About **84 percent of the sample respondents belong to other backward classes (OBC).**

The following table provides a summary of the quantum of activities carried out under each activity category of the four thematic areas (see Table 6).

Table 6: Summary of Quantum of Beneficiaries Reached Under Each Activity Category of Four Thematic Areas

Activity Category	Activities
NRM	
Irrigation Management	Construction of farm pond Community pond Pond desiltation Well deepening and repair
Water management-agriculture	Stop dams
Farm Management	Multi-tier cropping system
Clean Energy	Solar street lights Solar drinking water supply
ST&LE	
Agriculture Training and Support	Crop demonstration Vegetable demonstration Fodder crop demonstration Farm field school Construction of vermi-compost pits Azolla cultivation
SHG-Based Women Empowerment	Capacity building of SHG provision of small business
Entrepreneurship Development	Masala making unit *Dona pattal* making machine Sewing machine unit
Livestock management	Goatry unit
H&S	
Health	-
Sanitation	Soak pit construction near handpump
Kitchen Garden	Seeds, training, demonstrations
PoE	

Educational Institutions Development	School building renovation BaLA, Drinking water posts/RO filters Smart class Toilet renovation Sports Material

The following section highlights the key findings from the field survey conducted to assess the impact of the project after its completion.

3.1 Natural Resource Management

Under NRM, water conservation and farmer support for better yield were prioritized. The several trainings on improved farming techniques, water interventions, and distribution of seeds have resulted in better productivity and increased income from agriculture. This was important in the area, as the availability of good quality seeds was an issue. The number of beneficiaries is mentioned in the above table (Table 6).

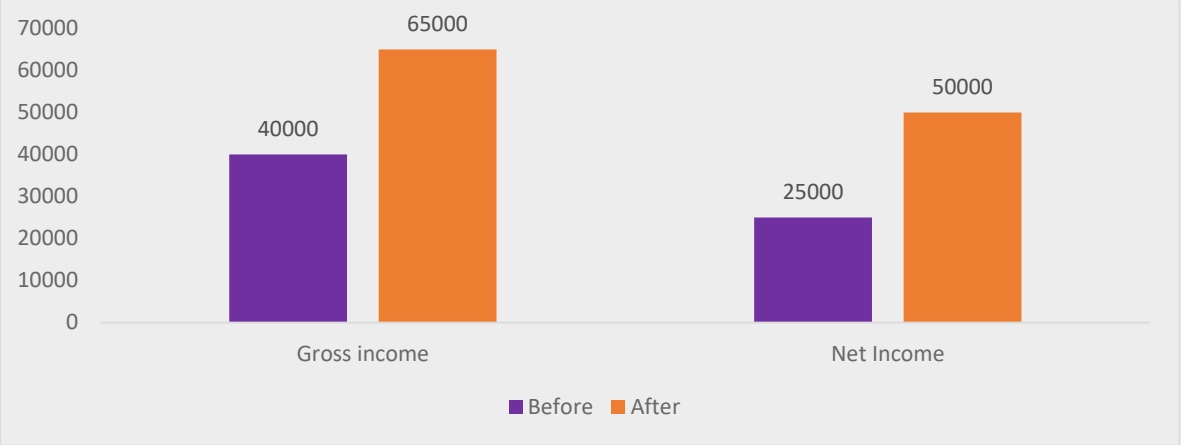
The objective of NRM interventions was to improve land and crop productivity and ultimately increase farmers' agricultural income through increased access to farm management infrastructure and irrigation mechanisms. The aim was also to increase the adoption of clean energy solutions. The sections below focus on the impact created with regard to these objectives.

3.1.1 Income from Agriculture

Under the agriculture interventions, three broad categories of implementation were employed: irrigation, water management, and farm management. The irrigation interventions included the construction of farm ponds, community ponds, pond desiltation, and well deepening and repair. For water management, building stop dams in crucial spots was the main intervention. The farm management interventions included a multi-tier cropping system as the main intervention. Despite the critical need for stop dams in some villages, bureaucratic delays prevented their construction (area under forest department). These have been further detailed out in Annexure **Error! Reference source not found.**.

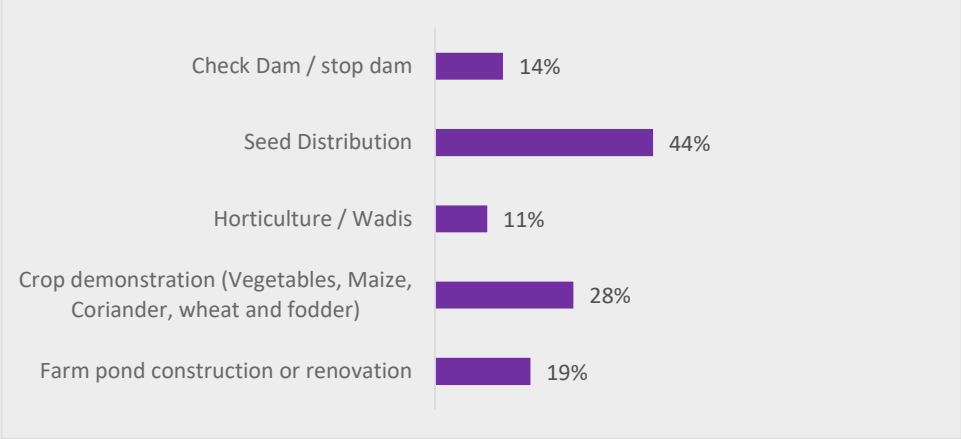
Approximately **57 percent of survey respondents reported benefiting from agricultural activities**. **Seed distribution (45 percent)** and **crop demonstration of vegetables, maize, coriander, wheat, and fodder crops (31 percent)** were among the most utilised interventions. Respondents indicated a **rise in net income within the project areas, with 96 percent reporting an increase**. The **average gross income rose by 63 percent** across the ten villages, while the **average net agricultural income rose by a remarkable 108 percent**. Some villages saw larger income increases than others. For example, the **average net income in Barkheda rose over 150 percent**, while Jhukar Jogi saw an increase of **98 percent**. Upon conducting a z-test, it was found **that an increase in income is statistically significant at a 95% confidence level.**

Figure 10: Increase in Median Agricultural Income (n=235)



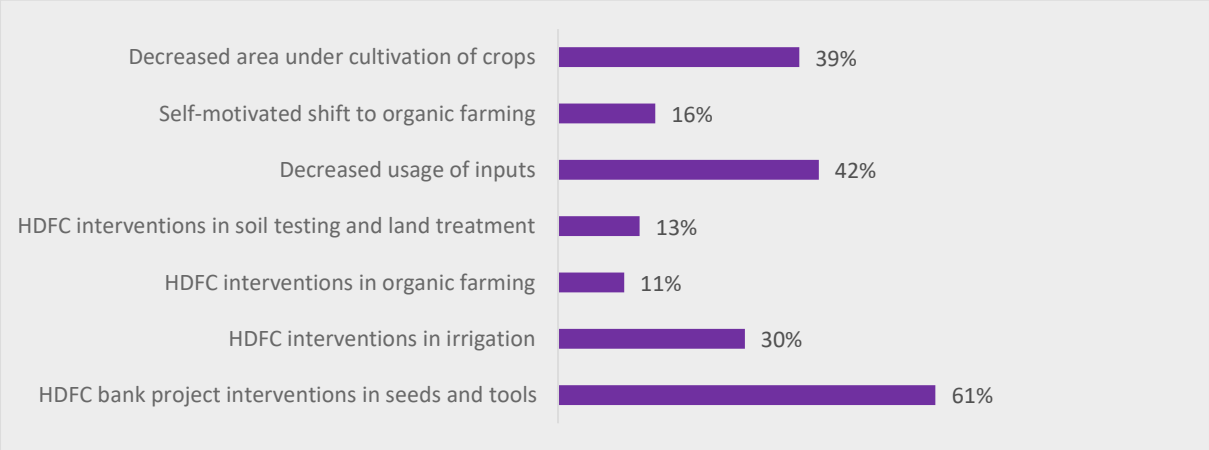
The following graph shows the interventions that have contributed to the increase in income:

Figure 11: Interventions that have Contributed to Increased Income (n=219)



The input cost has been reduced, as **stated by 68 percent of the respondents**. However, 24 percent of them state that it has increased, while the rest responded that there has been no change. Some of the reasons for decreased input costs are as follows:

Figure 12: Reasons for Decreased Input Cost (n=160)

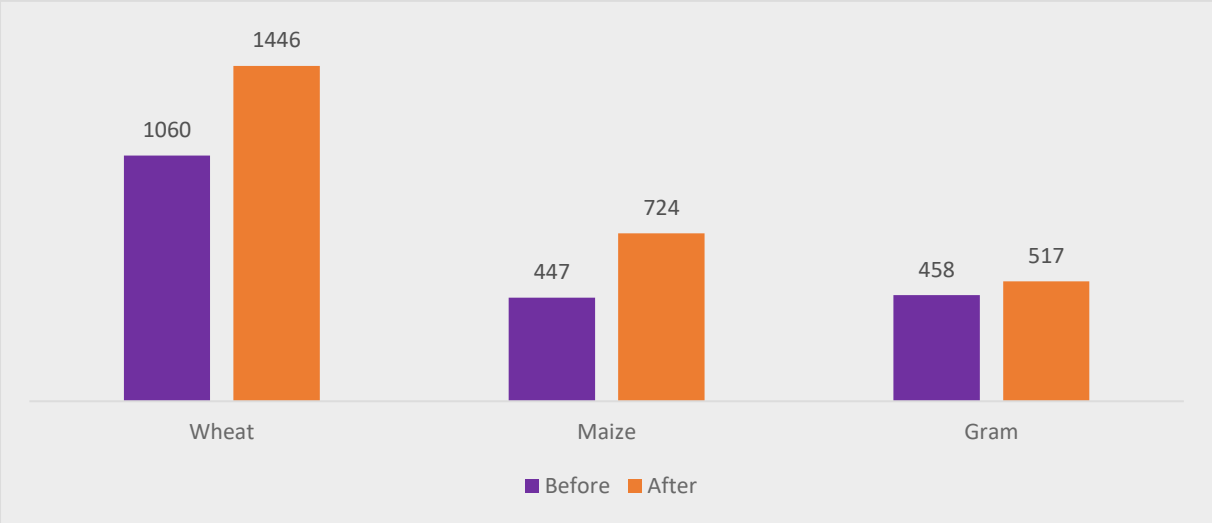


The increase in income can be attributed to the availability of irrigation. **Before the project, about 51 percent of the respondents had access to irrigation for their land**. **After the intervention, more than 75 percent** of the respondents have reported access to irrigation support. Upon interaction with farmers, they have expressed how, **with access to irrigation, they**

are able to grow two crops in a year, which has resulted in an increase in income. The **stop dam built in Nagori** has been especially **beneficial for more than 25 households** and has helped **irrigate up to 45 acres** of land. With **irrigation and better-quality seeds**, the **productivity of wheat has increased** from **10 quintals/acre to more than 15 quintals/acre**. They have also been able to grow vegetable crops, which are water intensive.

Madhya Pradesh is a major producer state, primarily producing grains such as wheat, sorghum, maize, chickpea, etc. The state also surpassed Punjab in wheat production in 2020[3], with a share of 31 percent of the total wheat production in the country. Close to **88 percent of the respondents have indicated that their wheat production has increased**. In addition to wheat, farmers in the region grow maize and gram. Approximately 77 percent of farmers who grow maize and gram have responded that their crop production has increased. The **average mean productivity of wheat has increased by 36 percent, while maize productivity rose by 62 percent.** The state average productivity of wheat is 1396 kg/acre in 2021-22[4], while the **productivity of wheat after the intervention is 1446 kg/acre**.

Figure 13: Average Mean Productivity of Wheat, Maize, and Gram in project villages (in kg/acre)

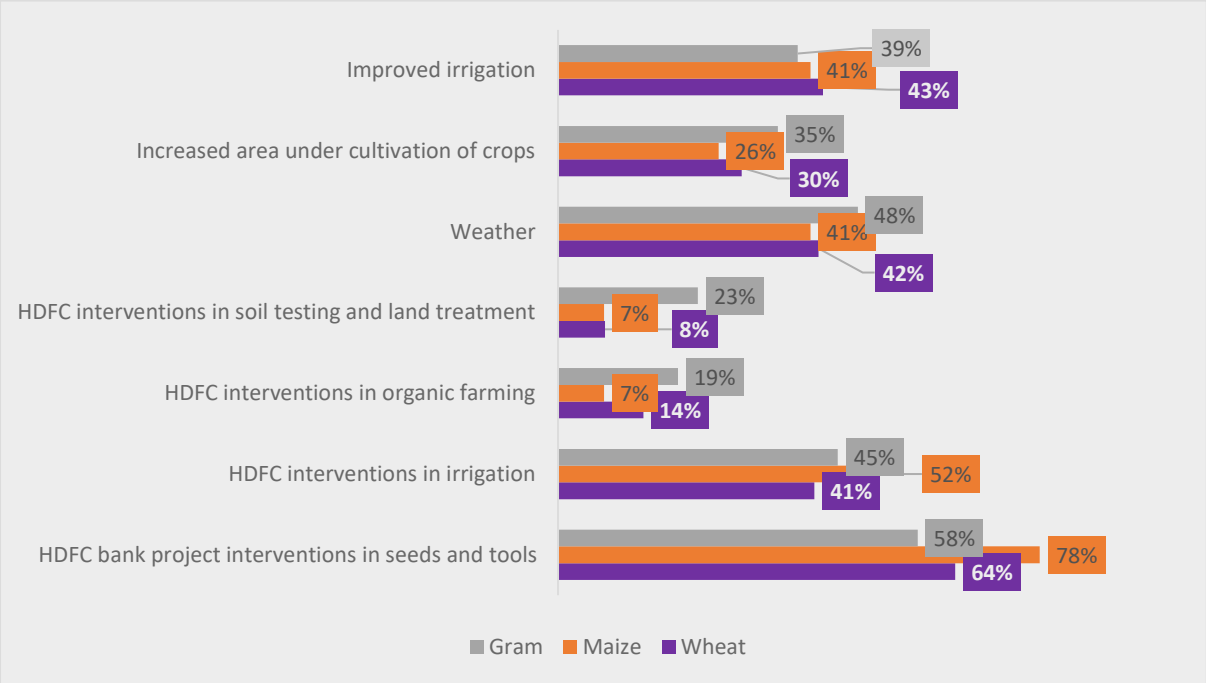


This increase in productivity can be attributed to various factors, including HDFC interventions such as the availability of high quality seeds, improved access to irrigation, and others, as shown in Figure 14. Many of these interventions directly led to the availability of water during the drier seasons of the year, due to which farmers were able to grow more than one (monsoon dependent) crop on their land.

[3] The Indian Express

[4] Agriculture Statistics At a Glance 2022

Figure 14: Factors leading to increase in paddy and wheat and Gram production (n=145, 27, 31)



Due to the lack of irrigation facilities, through the project, select farmers in suitable geographical locations were provided with coriander seeds to begin their journey towards coriander farming. The coriander seeds that were provided are less water-intensive, which is helpful for farmers who have little to no access to irrigation. **Around 34 percent of farmers have begun cultivating coriander after the intervention** and have reported both increased productivity and increased income from the same. Farmers are fully satisfied with the support required for coriander farming and are hoping prices will remain stable for the crop.

Figure 15: Farm pond

Figure 16: Stop Dam in Nagori

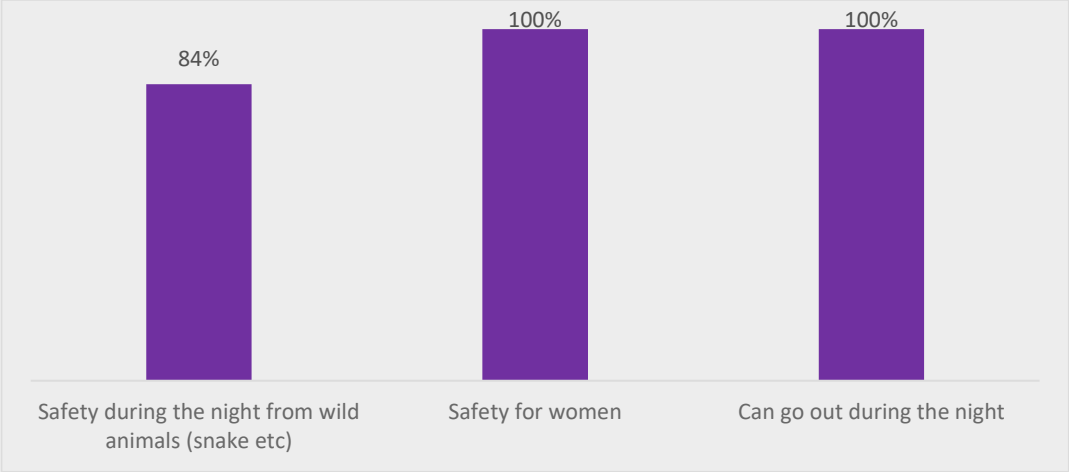
3.1.2 Use of Clean Energy Solutions

The main interventions that were implemented under clean energy were the installation of solar streetlights, and solar water pumps, which have been covered in the **Error! Reference source**

not found. section. The solar streetlights are especially helpful during the winter season, when darkness envelops the region as early as late afternoon.

During interaction with the community, it was found that several lights were not in working condition. As the community was not trained in fixing it, it was expensive for the residents to get the lights repaired. Hence, it remains dark in some parts of the villages.

Figure 17: Perceived Benefits of Solar Streetlights (n=32)



3.1.3 Impact Observation

Land and crop productivity and access to farm management infrastructure show a medium impact on the beneficiaries. Increased adoption of crop diversification shows a high impact on the beneficiaries, considering the adoption of coriander, which has high productivity and fetches better rate while requiring minimal water. Land under irrigation shows low impact as some interventions were not implemented as planned due to bureaucratic hurdles, hence reaching fewer farmers. Adoption of clean energy has had a medium impact as many of the lights installed are not in working condition. The specifics of the impact calculation can be seen in Table 11.

Figure 18: Overview of Project Effectiveness and Impact of Interventions-NRM

3.1.4 Case Study

A new crop uplifting the standard of living of farmers

Pritam Singh Yadav in Barkheda village of Lateri block in Vidisha had never known about coriander farming. In 2021, with the help and suggestion of Arpan Seva Sansthan through HDFC's HRDP, he sowed his first coriander seeds. He had first received 30 kg of high-yielding, less water-intensive seeds through the project. This crop is less water intensive than wheat or maize, and can be sown in the drier seasons, like winter. He reaps about 20-22 quintals of coriander seeds per season, in about 5 bigha of land, and it fetches a much higher price as compared to wheat, of about Rs. 9000-10000 per quintal, thus effectively earning about Rs. 2,00,000 each season. If prices fluctuate, he is able to store the crop and wait until he can receive better prices.

Earlier, he grew only wheat, and if water was available, he was able to grow maize sometimes. But now, with coriander, he's able to lead a good lifestyle, and afford to expand his house for more storage.

Figure 19: Coriander seeds stored

3.2 Skill Training and Livelihood Enhancement

Under ST&LE, activities included women's empowerment and training farmers in diverse agricultural practices. Workshops and training sessions have covered a range of farming techniques, such as the application of organic manure, construction of vermi-compost pits, fodder crop demonstrations, and azolla cultivation for farmers. These initiatives have been well-received by local farmers, addressing a significant need given the predominant occupation of many households in agriculture. Moreover, through the support of women-led Self-Help Groups (SHGs), women have received training and opportunities to generate income, enabling them to financially contribute to their families. Participants in this project have expressed satisfaction with their newfound ability to support themselves and their households. Additionally, interventions in livestock management have constituted a significant aspect of the program.

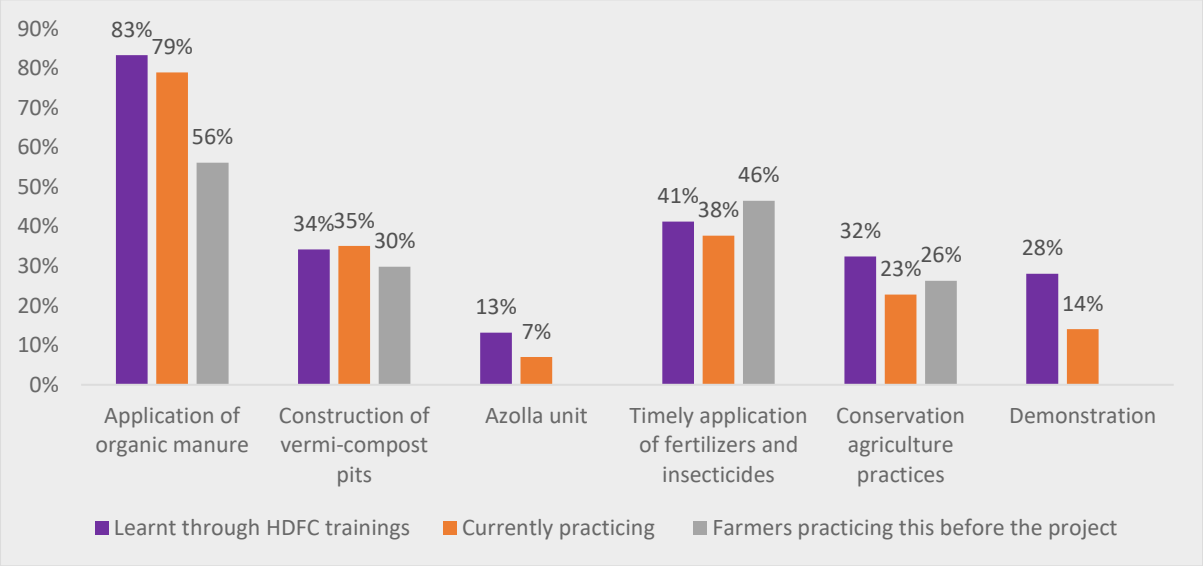
3.2.1 Agriculture Training and Services

The project carried out a number of initiatives to support sustainable agriculture. Farm field school, crop demonstration, fodder crop demonstration, and vegetable demonstration provided ample training and knowledge to farmers in cultivating them. Azolla cultivation, and the creation of vermi-pits improved soil quality and promoted crop growth. These interventions enhanced agricultural sustainability and productivity, enhancing the livelihoods of the community and the environment. The respondents state that the trainings have been very useful.

The community's adoption of sustainable agricultural practises has greatly benefited from HDFC trainings. Most of the **farmers reported HDFC and Arpan Seva Sansthan trainings as the source of awareness** of certain practices, such as **application of organic manure (86 percent), vermi-composting (97percent), and azolla units (91 percent).** The farmers were able to learn these through farmer field schools and exposure visits conducted by Arpan Seva Sansthan under the HRDP.

Several farmers are still utilising these practices even after the completion of the programme, as seen in Figure 20. This reflects the sustainability of the implemented interventions.

Figure 20: Agriculture Practices Learned through HDFC Trainings and Currently Practicing (n=114)



While farmers were aware of and had been practicing most of the practices before the intervention, azolla unit training and crop, vegetable, and fodder demonstrations were new. Even though it has reached fewer farmers, those who received it are fully satisfied with it.

About **93 percent of respondents have also reported that their income has increased, which is corroborated in the section 3.1.1**. More than **89 percent of the respondents have stated that the productivity of crops have increased.** In addition to this, **reduced input cost (60 percent), ease of farming (36 percent), reduced crop loss (27 percent), and improved soil health (26 percent) are also some benefits observed** by the respondents.

3.2.2 Economic Empowerment through Collectivization

Most of the enterprises that were established trough the support of Arpan Seva Sansthan and HDFC were for women through SHGs. However, due to the conservative nature of the population in this region, minimal work has been carried out in this regard. *Dona pattal* machine, masala making unit, and sewing machines were provided. Capacity building for women to carry out these activities was provided; however, it was found that while the women worked with the machines, other administrative activities—including but not limited to raw material procurement, finance and accounts management, marketing of products, etc., —were generally carried out by the male members of their families. It was also found that only a select few members of the SHG were involved in these activities. Some women also received sewing machines and training for the same.

Upon interaction with the SHG working with both the ***dona pattal*** **unit and the masala making unit, it was found that they earned anywhere between INR 200 and INR 500 every week per person.** This has supported their income generation and helped increase savings of their group.

3.2.3 Skill and Entrepreneurship Development

Training for skill and entrepreneurship development has predominantly been carried out through SHGs as mentioned above. Business activities are collectively undertaken by SHGs rather than individuals. Consequently, the number of responses aligns with the count of SHGs engaged in income-generating activities (IGA).

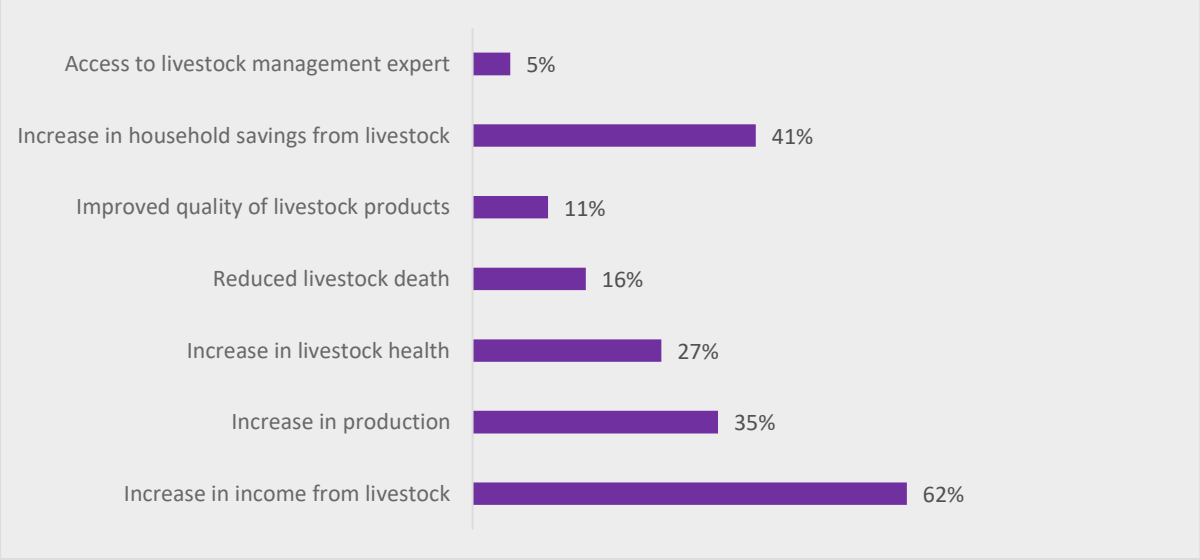
Training has been imparted in a few IGAs, as detailed in Section 3.2.2. These encompass masala making units, *dona pattal* units, tailoring, and goat farming. Participants have received instruction in business management, marketing support, enterprise establishment, and information on production techniques and practices.

3.2.4 Livestock Management and Training

Madhya Pradesh is a state rich in livestock, specifically buffaloes and cows. However, the major intervention conducted was the promotion of goat farming, specifically by providing goats to beneficiaries. Around **58 percent of the respondents have received goats**. They were also able to gain training and information on rearing the goats, which they previously had no access to.

Benefits of receiving goats include increased income, among others, as described in the following graph:

Figure 21: Benefits of Livestock Management and Training Received by Beneficiaries (n=37)



These interventions have been highly beneficial for the beneficiaries. During interactions with them, they **have expressed their contentment** with the interventions. They have also stated that their goats are much healthier than before. Beneficiaries have also reported an increase in income from livestock. Based on the median, **monthly income from livestock has increased by 60%.**

3.2.5 Case Study

Multi-Tier Farming Initiative Yields Significant Returns for Rural Farmer

In Barkheda village of Lateri block, Vidisha district, Jagan Lal Yadav embraced the concept of multi-tier farming with support from HDFC and Arpan Seva Sansthan. The organizations provided Mr. Yadav with

vegetable seeds and tree saplings, which he planted on a 3,600 square foot plot. His diverse crop selection included guava trees, potatoes, bitter gourd, and various other vegetables. Additionally, Mr. Yadav contributed Rs. 2,000 and received fertilizers, pesticides, and a spray pump set to facilitate efficient application of agricultural inputs.

The intervention proved highly successful, with Mr. Yadav reporting earnings of Rs. 1,44,000 in the previous year solely from his multi-tier farming endeavor. This innovative approach to agriculture demonstrated significant potential for enhancing rural livelihoods. However, despite the initial success, Mr. Yadav was unable to continue the practice due to the persistent water scarcity issues prevalent in the region, highlighting the need for sustainable water management solutions to support such agricultural innovations.

3.2.6 Impact Observation

Interventions in agriculture training services and the adoption of improved farming practices have seen a high impact. This can be backed by the increase in income from these interventions. Adoption of scientific approaches for livestock management and access to self-employment and entrepreneurial opportunities have had a medium impact on the beneficiaries as they were implemented on a much smaller scale. The specifics of the impact calculation can be seen in Table 11.

Figure 22: Overview of Project Effectiveness and Impact of Interventions-ST&LE

3.3 Health and Sanitation

Few interventions have been supported under Health and Sanitation, while the primary focus has been on NRM and ST&LE. Under H&S, support to develop a kitchen garden and the provision of a few solar drinking water tanks were the primary activities conducted. The drinking water supply has benefitted the respondents, as they are now able to get a clean drinking water supply throughout the year as opposed to only 8 months before the intervention.

3.3.1 Kitchen Gardens

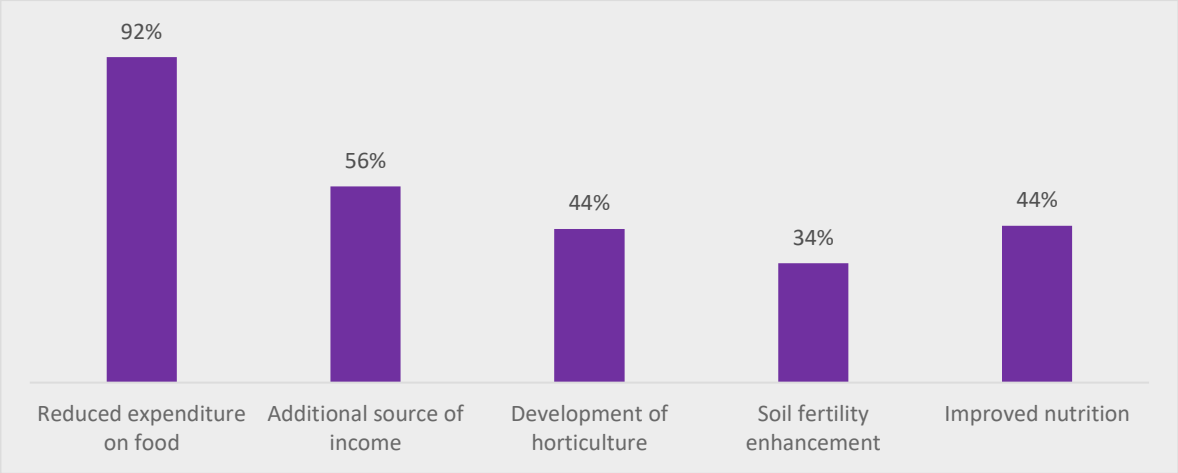
More than half of the respondents received benefits for their kitchen gardens. Under kitchen garden**, beneficiaries were supported with seeds (97 percent), training (82 percent)** to

improve their gardening abilities**, demonstrations (24 percent), and provision of fertilizers and pesticides (percent).** The distribution of seeds is a crucial support, as it helped the beneficiaries begin their kitchen gardens. A sizable number of people have been able to successfully establish and maintain their kitchen gardens thanks to the provision of seeds and training. These initiatives support community improvement in food security, healthy eating practises, and self-sufficiency.

The respondents have mostly received seeds for growing bitter gourd, tomato, cabbage, cauliflower, brinjal, chilli, and bottle gourd, among other regularly used vegetables. The **self-consumption of their produce by more than 86 percent of households** results in the direct delivery of wholesome, fresh food to households.

More than **78 percent of the respondents claimed that the amount spent on fruits and vegetables has decreased noticeably, saving an average of Rs. 400 per week.** This is further corroborated by **more than 92 percent of the respondents reporting that *reduced expenditure on fruits and vegetables* is one of the top three critical perceived benefits** of these kitchen gardens.

Figure 23: Perceived Benefits of Kitchen Gardens (n=216)



3.3.2 Impact Observation

A high impact has been seen when it comes to interventions in kitchen gardens and drinking water. The kitchen garden is a popular intervention and has been accepted by the beneficiaries with enthusiasm. Even though the scale of interventions was not as high as compared to ST&LE or NRM, it has still helped the beneficiaries. The specifics of the impact calculation can be seen in Table 11.

Figure 24: Overview of Project Effectiveness and Impact of Interventions-H&S

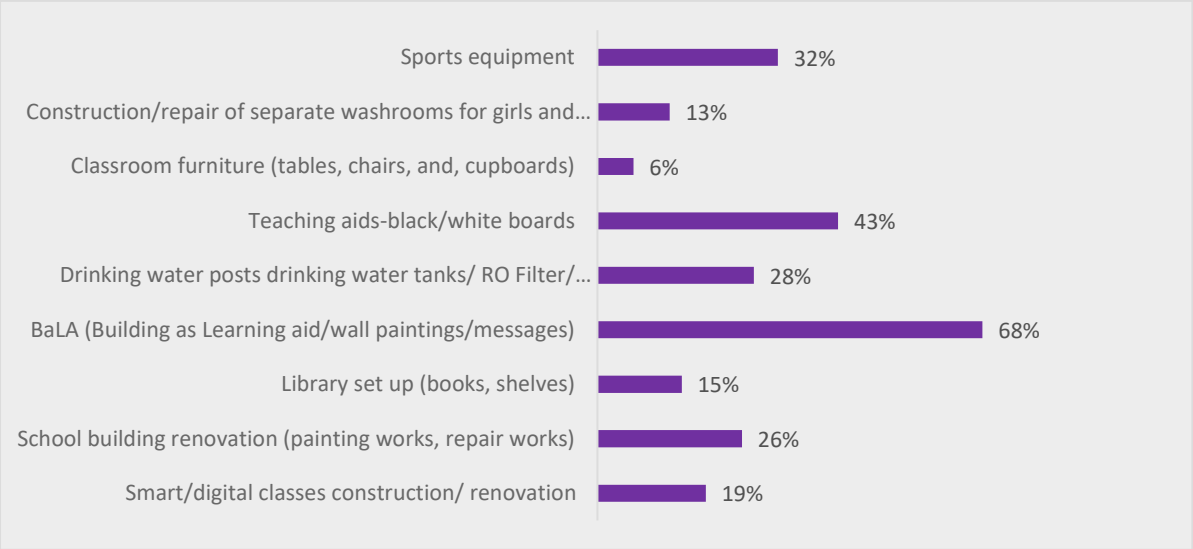
3.4 Promotion of Education

In the area of education, schools in ten project villages of Lateri block have had their restrooms renovated, wall paintings, or BaLA, drinking water posts, smart classes installed, and sports materials provided.

3.4.1 Infrastructure in Educational Institutions

Drinking water posts, BaLA paintings, renovation of washrooms for boys and girls, smart class installation, sports materials provision were some of the interventions conducted in the schools in Lateri, Vidisha. They have been detailed out in Annexure **Error! Reference source not found.**. The scale of these is further elaborated in Figure 25.

Figure 25: Interventions in Schools as Reported by Student Beneficiaries (n=47)

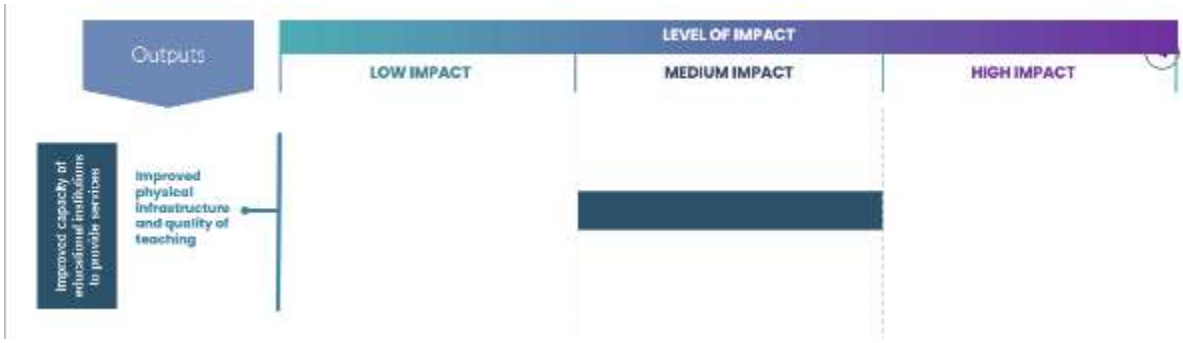


The students have reported that they use all these facilities **often (most days or sometimes)**. About 80 percent of the parents confirm that due to the **availability of safe and clean drinking water, their kids now face fewer health issues and can spend more time in school. All the students say that now, due to having separate washrooms for boys and girls, they can attend school regularly.** This is further corroborated by the responses given by teachers, who say that attendance has improved, and dropout rates have decreased, and students are able to retain concepts better.

Figure 26: Separate washrooms for boys and girls in a school in Jhukar Jogi

3.4.2 Impact Observation

Figure 27: Overview of Project Effectiveness and Impact of Interventions-PoE



Although the interventions in education were fewer, they had high impact. With time, the scale of intervention could have been increased, thus having a much wider impact on the school students and their learning. The specifics of the impact calculation can be seen in Table 11.

In order to reach the greatest number of people possible, Arpan Seva Sansthan and HDFC Bank have worked tirelessly across all sectors in this area. Due to the short duration of the project, however, it was unable to realise its full potential. The project could have gone on for a few more years, which might have had a more beneficial effect.

4.5. Holistic Rural Development Index

There are multiple dimensions involved in achieving the goals of rural development, and the resulting blend raises agricultural production, generates new jobs, enhances health, increases communication, and provides better living infrastructure.

HDFC Bank adopted the Holistic Rural Development Index (HRDI) for evaluation of HRDP as it aims to achieve holistic rural development through a multitude of interventions that would lead to overall improvements across related dimensions. Therefore, the project introduced significant variability in interventions across districts. As such, it was not possible to ascribe a single impact indicator that might be able to accurately capture the overall performance of HRDP.

Since there was no baseline data available for this assessment, the recall method was used in the household survey to assess the change that beneficiaries experienced before and after project implementation. For this purpose, the enumerators were trained to ask beneficiaries to recall the value of critical indicators at the start of the project.

The impact indicators with baseline and endline data were selected and assigned weights based on their relative contribution to the final expected outcome across all theme-wise interventions. While most of the indicators were found to be relevant for the study, a few needed modifications in accordance with the project, the study design, and the information collected. The detailed methodology and indicators are explained in detail (See Annexure B).

Table 7: List of Indicators Used to Calculate HRDI

NRM	Proportion of farmers with net income above median
	Proportion of farmers reporting increased productivity of three main crops above median (before and after)
	Percentage of farmers reporting access to irrigation
H&S	Percentage of households reporting increase in use of fruits/vegetables from the nutrition garden
	Percentage of households reporting increased availability of drinking water facility
	Percentage of households with access to improved toilet facility
Skill	Percentage of SHG members reporting income above median from rural enterprises
	Percentage of households who getting skill training & reported increase in income from job/enterprise/self-employment
	Percentage of households reporting income above median from livestock
Education	Percentage of respondents reporting increased access to functional school physical infrastructure (drinking water posts, separate washrooms, furniture etc.)
	Percentage of respondents reporting increased access to functional learning infrastructure (library, science labs, smart class, etc.)

Based on our study, the HRDI for Lateri, Vidisha has been calculated.

Table 8: HRDI for P0311

Domain	NRM		ST&LE		H&S		PoE		Total	
HRDI Score	Base line	End line	Base line	End line	Base line	End line	Baseline	Endline	Baseline	Endline
	0.07	**0.11**	**0.07**	**0.11**	**0.05**	**0.12**	**0.19**	**0.25**	**0.39**	**0.60**
%Change	**57%**		**47%**		**127%**		**35%**		**55%**	

A remarkable positive change can be seen. The theme-wise indicators assigned varied weights to arrive at the composite HRDI score of 0.60 indicating a notable positive change toward the desired impact from the baseline score of 0.42. There is a 57 percent positive change in NRM and ST&LE, while H&S has shown a positive increase by 140 percent. This could be attributed to the low baseline score and the extensive work done. The indicators used for the calculation of the HRDI score were not present at baseline. PoE has also shown an increase of 14 percent over the baseline.

4 Analysis of Assessment Criteria

As outlined earlier in 1.7, for each thematic area, activities completed by ACF were identified and assessed using the following criteria:

- Relevance and Convergence
- Impact and Effectiveness[5]
- Sustainability

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

4.1 Relevance and Convergence

Despite being a rapidly developing region, Madhya Pradesh requires an accelerated pace of development due to persistent challenges, notwithstanding various government schemes and provisions in place. These challenges encompass issues such as poverty, deficient infrastructure across various sectors, and disparities in education. The project initiated by HDFC Bank and Arpan Seva Sansthan, aims to address these issues through a holistic and integrated approach. The project focuses on empowering communities in various sectors, including livelihoods, agriculture and natural resource management, health and sanitation, and education. The selected villages in the Lateri block were chosen based on their socio-economic criteria, as the block is the least developed in the entire district. The goal of this integrated development approach is to uplift communities, bridge the basic development gap in the region, and achieve sustainable growth and improvement in human development indicators.

Lateri block is drier than other regions. The land beneath is highly rocky, which doesn't support the seepage of groundwater. Hence, people in the region are unable to use groundwater as a source for irrigation. An alternative was highly necessary. Along the same line, bringing in crops that required less water was also helpful to farmers.

While SHGs have been formed through NRLM scheme in this region, due to lack of trust and issues like non-repayment of loans, very few are functional. The team at Arpan Seva Sansthan have kick-started the empowerment of women by interacting with them and supporting them in their own enterprises.

There has been no convergence with government schemes for this project. Despite the several challenges faced by the team at Arpan Seva Sansthan, they have continued to work towards the community tirelessly and the ongoing commitment is evident.

4.2 Sustainability

Positive outcomes in terms of increased output and income have come from the agricultural interventions. More than 60% of the project's beneficiary farmers are currently using the practices and services for farm management, specifically application of organic manure and in a timely manner. The project's inputs are still being used by the beneficiaries. High-yielding variety of seeds of wheat which were provided through the project are being used even after several

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

seasons. However, farmers mentioned that these seeds will need to be replaced after four or five seasons. Arrangements for the provision of seeds and linkage with providers would have been more beneficial to the farmers. It is also applicable for multi-tier farming. Farmers received vegetable seeds, tree saplings, and support to build structures. However, even with the success of the activity, most of them have not continued after the harvest as they were unable to procure good quality seeds. More support in this regard would have been more beneficial.

The availability of water for irrigation has encouraged them to undertake more than one crop a year. However, even with the several stop dams, farm ponds, and wells, it did not reach many farmers. To combat this, Arpan Seva Sansthan introduced coriander farming, which has seen immense success.

In this region, SHGs are hardly functional, but Arpan Seva Sansthan's efforts to empower women do not go unnoticed. More focus on skill development for self-employment could have been undertaken so that they could be more independent.

Arpan Seva Sansthan recognizes the need for such programmes to be conducted in the region and has continued to work in this region with HDFC and other partners.

5 Conclusion

5.1 Summary of Findings

The report highlights the findings of a project focused on natural resource management, skill training and livelihood enhancement, health and sanitation, and the promotion of education in Lateri, Vidisha.

In NRM, the activities implemented included irrigation, water management, and farm management. The irrigation interventions included the construction of farm ponds, community ponds, pond desiltation, well deepening and repair, the construction of stop dams, solar streetlights, and solar drinking water supply. On average, **median net income rose from Rs. 25,000 to Rs. 50,000, showing an increase of 100 percent.** Post-intervention in Lateri, Vidisha, **mean wheat production increased from 2801 kilograms to 3683 kilograms on average**. The **median average productivity of wheat has increased by 36 percent from pre-intervention levels.** The project has encouraged crop diversification, leading to changes in the proportion of farmers growing various crops. **Coriander has been one of the main crops being grown** after the intervention, **with 95 percent of the respondents stating an increased income** with crop change. The implementation of clean energy interventions, including solar water pumps, has helped very small percentage of the respondents access clean drinking water and streetlights.

Due to the immediate necessity of interventions in agriculture, NRM was heavily focused on in this region. However, under health and sanitation, Arpan Seva Sansthan successfully introduced kitchen gardening, and it has been widely accepted by people across the 10 project villages. Under this, **beneficiaries received seeds (97%), training (82%), demonstrations (24%), and fertilizers/pesticides (15%),** resulting in enhanced gardening abilities and reduced expenditure on fruits and vegetables, **saving an average of Rs. 400 per week for over 52 percent of the participants**.

The project, focusing on skill training and livelihood enhancement, implemented initiatives such as farm field schools, exposure visits, and vermi-pits to promote sustainable agriculture. HDFC-conducted trainings were instrumental, leading to increased awareness of practices like organic manure application and conservation agriculture. The sustained adoption of these practices is evident post-program completion. Survey results indicate positive outcomes, **with over 89 percent of respondents experiencing increased crop productivity** and **93 percent reporting a rise in income**. Additional benefits include **reduced input cost (60%), improved soil health (26%), reduced crop loss (27%),** and **enhanced pest management (19%).**

HDFC's support for SHG development has been minimal, as there are few functioning SHGs in the area. However, they have set up enterprises for a few SHGs, which have been moderately successful.

Livestock management interventions have primarily included the provision of goats for goat rearing and have benefitted about 10 percent of the respondents. Beneficiaries express contentment, reporting healthy goats, reduced livestock deaths, increased income, and a **60% median increase in monthly income from livestock**.

In Lateri schools, interventions such as **installing drinking water posts, implementing BaLA paintings, installing smart classes, providing sports equipment, and constructing separate washrooms for boys and girls** have been successfully conducted. **All of the students reported**

frequent use of these facilities, attributing the availability of safe drinking water to a decrease in health issues and an increase in time spent at school. All the students enjoy using smart classes for their learning, stating that **lessons are more interesting (55%), lessons are easier to understand (44%), and lessons are easier to remember (22%).** The provision of separate washrooms for boys and girls has positively impacted attendance, with **all students stating they can now spend more time in school and attend regularly.**

The HRDI score of **0.60 indicates a positive change of 43 percent toward the desired impact from the baseline score of 0.42.**

5.2 Recommendations

Arpan Seva Sansthan and HDFC Bank together, have worked tirelessly with the community to be able to provide them with the necessary facilities to help lead their lives with dignity. However, to bridge the gaps in implementation and address the challenges, some recommendations are discussed below.

Recommendations for project initiatives:

- To increase adaption and sustainability of farming practices, the implementing partner may ensure that farmers adhere to the agricultural techniques that have been taught and support follow-up visits with farmers. Experts in agriculture should preferably arrange these visits (ideally from KVK).
- To empower farmers, the project can focus more on value-added processing. This includes setting up small-scale processing units specifically for crops like coriander. Farmers can be offered training on value-added processing techniques and quality control measures. Additionally, to help them reach wider markets, support can be provided in developing new products from their crops (such as dalia from wheat), along with packaging and branding assistance.
- Establish demonstration plots to showcase the benefits of crop diversification. Use these plots to conduct trials and gather data on new crop varieties that can be scaled up in the area. Provide financial support for purchasing seeds and few other inputs for new crops.
- Train community members in basic maintenance and repair of solar streetlights and water pumps to ensure longevity and functionality. Explore additional clean energy solutions such as solar-powered irrigation systems and energy-efficient farming equipment to reduce dependency on non-renewable energy sources.
- In the project villages, there are no Primary Health Care Units, or Animal Care Centres. Interventions in the health sector would have been more beneficial considering the fact that the people of these villages have to travel for more than 30 kilometers to reach the nearest hospital.
- Revival of SHGs is crucial in this region. Women are hardly involved in decision-making of their houses or their villages because of their conservative approach. Revival of SHGs can uplift women further and bring about a change in their approach and give them more confidence to be more involved in the village development activities.
- Training for relevant skills that could support in employment could be undertaken. Further, creating employer-employee linkage can also aid in better employment opportunities, especially to the youth.

Recommendations that can improve the design of the HRDP:

- Extending the project's duration from three to five years can aid in better programme implementation and maintenance.
- It is recommended that project focuses on establishment/revival of community level organizations such as Village Development Committees (VDCs) or linkages with other existing set ups such as Panchayati Raj Institutions for sustainability of the interventions after the completion of project duration. This will make the beneficiaries self-sustainable in managing the assets, such as street lights, water storage structures and learning material provided in schools.

(Annexures)

A Sampling Methodology

The quantitative household survey was administered for four thematic areas in each 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 400.

A.2 Quantitative Sampling Methodology

Quantitative Sampling Methodology

10 project villages with the highest number of beneficiaries were selected for the study. The stages of sampling are explained as follows:

Stage 1 – Selection of beneficiaries:

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

Stage 2- Sampling for villages:

Sampling for each village was done using the Probability Proportionate to Size (PPS) method. The percentage of the total number of beneficiaries in a village was taken out from the total beneficiaries. This percentage was then converted into a sample per village. 5 villages with the lowest sample size were merged with other villages to make a total of 9 villages to be covered under the survey.

Stage 3- Sampling for activities:

The total sample of 400 was then distributed amongst various themes depending on the significance of activities done.

A.3 Qualitative Sample Size Calculation

Qualitative tools of In-depth Interview (IDI) and Focus group discussions (FGD) 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 at the start of the program.

B HRDI Methodology

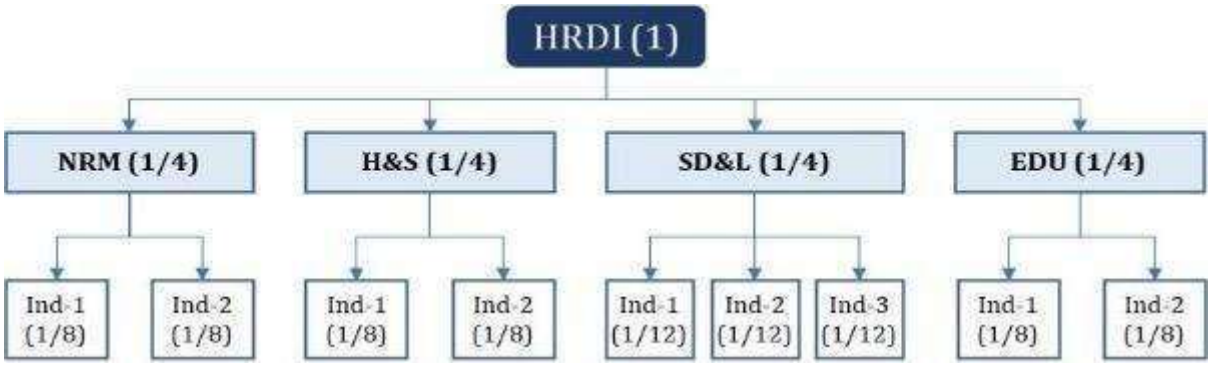
The outcome indicators included in the HRDI were obtained from different domains and are consequently measured on different scales. Therefore, to ensure the comparability of these indicators, all the indicators were converted into discrete variables such that the indicators could be measured between 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 28: Domain and Indicator Weights



The example above is indicative. The domains as well as indicators were different across all projects, 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 Lateri block of Vidisha district, Madhya Pradesh has been detailed below (see Table 10).

Table 10: HRDI Calculation for Madhya Pradesh

Domain	Indicators	Baseline score	Baseline HRDI	End line score	Endline HRDI	% Change
NRM	Proportion of farmers with net income above median	0.15	0.07	0.25	0.14	57
	Proportion of farmers reporting increased productivity of three main crops above median (before and after)	0.07		0.10		
	Percentage of farmers reporting access to irrigation	0.00		0.10		

Domain	Indicators	Baseline score	Baseline HRDI	End line score	Endline HRDI	% Change
H&S	Percentage of households reporting increase in use of fruits/vegetables from the nutrition garden	0.05	0.05	0.17	0.14	140
	Percentage of households reporting increase availability of drinking water facility	0.14		0.30		
	Percentage of households with access to improved toilet facility	0.03		0.03		
ST&LE	Percentage of SHG members reporting income above median from rural enterprises	0.00	0.07	0.00	0.11	47
	Percentage of households who getting skill training & reporting increase in income from job/enterprise/self employment	0.13		0.21		
	Percentage of HH reporting income above median from livestock	0.17		0.22		
PoE	Percentage of respondents reporting increased access to functional school physical infrastructure (drinking water posts, separate washrooms, furniture etc.)	0.35	0.19	0.50	0.25	35
	Percentage of respondents reporting increased access to functional learning infrastructure (library, science labs, smart class, etc.)	0.39		0.50		
Total			**0.39**		**0.60**	**55**

C Overview of Impact Calculation

Overview of Impact in the effectiveness section was calculated based on the averages of quantitative output indicators as demonstrated below.

Table 11: Impact calculation

Outputs	Output Indicators		Output Avg.	Impact Level
NA. Increased income from agriculture				
N. A1Land/ crop productivity	NA1. (a) Proportion of farmers reporting an increase in production of crops that were supported under HRDP	88%	69%	Medium
	NA1. (b) Proportion of farmers reporting increased input efficiency after the intervention	68%		
	NA1. (c) Proportion of farmers reporting increased income from crops that were supported under HRDP.	96%		
	N.A1.i(d) Average increase in income from crops that were supported under HRDP (% change)	58%		
	N.A1.I (e) Average increase in productivity from crops that were supported under HRDP (% change)	37%		
	N.A1.i(f) Average decrease in input cost (% change)	NA		
N.A2. Access to the farm management infrastructure	N.A2(a) Proportion of beneficiaries satisfied with the quality of available services (in farm management)	70%	43%	Medium
	NA2. (b) Proportion of farmers reporting project interventions in seeds, tools, and irrigation leading to an increase in production	31%		
	NA2. (c) Proportion of farmers reporting project interventions leading to increase in income (average of top 4-5 crops)	49%		
	NA2. (e) Proportion of farmers currently practicing organic farming/conservation agriculture/other sustainable practices	45%		
	N.A2.(f) The proportion of farmers reporting an increase in the use of natural fertilizers?	46%		
NA.3 Increased adoption of crop diversification	NA3. (a) Proportion of farmers diversifying their crops with project support.	96%	96%	High

	NA3. (b) Proportion of farmers who report income increase due to crop diversification (base = farmers who adopted crop diversification)	95%		
NA.5 Land under irrigation	NA (4). (b). The proportion of farmers who received support for irrigation	19%	19%	Low
NC. Increased use of clean energy solutions				
NC1.Adoption of clean energy infrastructure	NC1 (a) Proportion of HHs using clean energy infrastructure (Base=all)	11%	42%	Medium
	NC1. (b)Proportion of households reporting benefits from using clean energy infrastructure (Base=clean energy beneficiaries)	73%		
SA. Improved access to agricultural training and services				
S.A.1 Access to Agriculture training and services	SA.i(a) Proportion of farmers who reported project training services are useful	100%	71%	High
	SA.i(b) Proportion of farmers who demonstrate awareness regarding sustainable farming practices	41%		
S.A.2.Adoption of improved farming practices	SA.ii(a) Proportion of farmers who adopt scientific agricultural practices	47%	78%	High
	SA.ii(b) Proportion of beneficiaries reporting an increase in productivity due to better farm management	90%		
	SA.iii(c) Proportion of farmers reporting increased income	98%		
SB. Economic empowerment through collectivization (Only for SHG members)				
SB.1 Formation/ revival of SHG-based Enterprises	SB.i(a) Proportion of members who received support with establishing/reviving SHGs	NA	NA	NA
	SB.i(b) Proportion of members who received support with establishing/reviving SHG enterprises	NA		
	SB.i(b) Proportion of members whose SHGs are currently functioning	NA		
SB.2 Development of entrepreneurship	SB.ii(a) Proportion of SHG members who received training	NA	NA	NA
	SB.ii(b) Proportion of SHG members undertaking entrepreneurial activities	NA		
	SB.ii(d)Proportion of SHGs with increased savings	NA		

	SB.ii(e) Proportion of SHG members reporting improved income	NA		
SC. Enhanced capacity for regular income generation				
SC.1 Enhanced employable skill development	SC.1(a) Percentage of youth who accessed skill development training	NA	NA	NA
	SC.1(b) Percentage of youth who report improved income through skill development	NA		
SC.2 Access to self-employment and entrepreneurial opportunities	SC.2(a) Proportion of beneficiaries who established/ expanded entrepreneurial activities	89%	61%	Medium
	SC.2(b) Proportion of beneficiaries reporting improved capacity to undertake entrepreneurial activities	30%		
	SC.2(c) Proportion of beneficiary HHs reporting an increase in income	63%		
SD. Improved capacity to generate income through livestock management				
SD.1 Adoption of scientific management of livestock	SD.I (a) Proportion of beneficiaries who received support in livestock management services	9%	40%	Medium
	SD.i(b) Proportion of beneficiaries reporting an increase in income from livestock management	62%		
	SD.i(c)Proportion of beneficiaries reporting improved livestock health	27%		
	SD.i(d) Proportionate increase in average income from livestock	60%		
HA. Improved health infrastructure and services				
HA.1 Establishment/ enhancement of health infrastructure and services	HA.i(a) Proportion of beneficiaries who gained access to health services	NA	NA	NA
	HA. i(b) Proportion of beneficiaries reporting lifestyle changes due to improved access	NA		
	HA.i(c) Proportion of beneficiaries who consulted medical references from camps	NA		
H.B. Improved sanitation infrastructure and services				
HB.1 Establishment/ enhancement of sanitation infrastructure.	H.B.i(a) Proportion of beneficiaries who gained access to sanitation services	NA	NA	NA
	HB.i(b) Increase in no of HHs with access to sanitation infrastructure/ facilities	NA		

	HB.i(c) Proportion of beneficiaries reporting benefits due to improved access	NA		
H.C. Development of Kitchen gardens				
HC.1 Increased adoption of kitchen gardens	HC.i(a) Proportion of HHs reporting income gains from kitchen gardens	92%	86%	High
	HC. i (b) No of HHs received seeds/training in the kitchen garden	90%		
	HC.i(c) No of HHs with improved vegetable/fruit consumption due to kitchen gardens	75%		
HD Improved awareness and health-seeking behaviour				
HD.1 Awareness regarding health and sanitation practices	HD.i (a) Improved dietary practices/ reduced tobacco consumption/ improved physical exercise	NA	NA	NA
HD.2 Adoption of positive health and sanitation practices	HD.ii(b) Increase in no. of HHs adopting proper solid waste management practices	NA		
	HD.ii(c) Increase in no of HHs adopting proper liquid waste management practices	NA	NA	NA
HE. Improved availability and management of water				
HE.1. Access to drinking water at household and community levels improved	HE.1. (b)The proportion of households reporting improved well-being due to the availability of clean drinking water.	75%	75%	High
Outcome EA. Improved capacity of educational institutions to provide services				
EA.1 Access to improved physical infrastructure	EA.i(a) Proportion of students/schools who report gaining access to functioning smart classrooms/ Bala/science labs/libraries/learning aid/furniture/sports equipment	32%	66%	Medium
EA.2 Improvements in quality of teaching	EA.ii(a) Proportion of teachers regularly utilizing smart classrooms/libraries/smart class	100%		
Outcome EB. Improved learning outcomes				
EB.1 Improved exam performance and subject confidence among students	EB.i(a) Proportion of students who gained access to coaching classes	NA		
	EB.i(b) Proportion of students who report improvements in access to reference material	NA	NA	

	EB.i(c) Proportion of students reporting an increase in confidence in various subjects (lessons are easy to understand, more interesting, etc.)	NA		
	EB.i(d) Proportion of students who received scholarships	NA		
	EB.i(e) Proportion of teachers reporting improvements in learning outcomes due to infrastructural facilities at institutions (concept retention, attention span, and exam performance)	NA		

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 income from agriculture above baseline median.**

Table 12: Z-test Conducted for P0311

Indicator	Proportion of farmers with income from agriculture above baseline median
p1 (proportion of first sample-endline)	77
n1 (sample size of p1)	235
p2 (proportion of second sample-baseline)	46
n2 (sample size of p2)	235
p	0.261702128
Calculation	0.0405509
z statistic	7.644713111
	Statistically significant at 95% confidence level (or p<0.05)
P-value for the z statistic (calculated here: https://www.socscistatistics.com/pvalues/normaldistribution.aspx)	<0.00001

E Sustainability Theme-wise Matrix

The project support provided demonstrated the capability to continue even after the program ended. The project's support to sustain improved outcomes are demonstrated below:

Support provided	Structures established	Technical Know-how	Usage	Maintenance
NRM				
Water Management- Irrigation	✓		✓	✓
Farm Management	✓	✓	✓	✓
Clean Energy	✓	X	✓	X
Skill Training and Livelihood Enhancement				
Agriculture Training and Support	✓	✓	✓	✓
Livestock Management				
SHG Development	X	✓	✓	✓
Skill Development		✓		
Health and Sanitation				
Health Camps/clinics				
Kitchen Garden	✓	✓	✓	✓
Promotion of Education				
Educational Institution Development		✓	✓	✓

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