

# Impact Assessment Study under Holistic Rural Development Programme (HRDP)

## Kerala- P0263



Prepared For:



HDFC Bank Parivartan

Prepared By:



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## Executive Summary

The study centres on measuring the impact of the Holistic Rural Development Programme (HRDP) of HDFC Bank that was implemented by M S Swaminathan Research Foundation (MSSRF) across four clusters in Kerala covering 6 districts and 30 villages from 2018 -2022. This study largely focused on understanding the overall process that the HDFC Bank and the implementing organisation undertook in carrying out the programme activities, the key milestones achieved, the impact created by these activities, and the challenges faced. The key focus areas of the intervention were Natural Resource Management (NRM), Skill Training & Livelihood Enhancement (ST&LE), Health and Sanitation (H&S) and Promotion of Education (PoE). The framework used for the impact assessment was an adaptive version of the DAC criteria - Relevance, Effectiveness, and Sustainability. A comprehensive methodology, comprising both qualitative and quantitative primary data collection, was used for the assessment which was carried out in a participatory manner involving all the key stakeholders of the programme. The study included a sample size of 425 beneficiaries (403 for household survey and 22 for education survey) as respondents as against the planned sample of 400.

The HRDP project in the state was implemented in the context of devastating effects of Kerala floods in 2018 and 2019 further aggravated by the COVID 19 pandemic. In the initial years of the project cycle, the focus was on rebuilding the villages affected by floods, environment restoration, livelihood support and support in education and healthcare for the affected communities.

The project prioritized revitalizing ecological balance through community based natural resource management, strengthening local economy through resilient farming systems and improved livelihood opportunities, imparting knowledge to combat with climate change events and financial and social inclusion through participatory implementation. To address the loss of livelihoods among villagers due to the effects of Kerala floods and Covid-19 pandemic, mitigation plans were incorporated to provide immediate livelihood support to those households where the primary breadwinners have lost their jobs or deceased due to COVID. The project also focused on offering hand-holding support to farmers through trainings and plant clinics, construction of rainwater harvesting units for selected individuals / communities, infrastructural support and capacity building for enterprising units, kitchen gardens for improved nutrition, distribution of livestock, supporting tribal education, etc. Some interventions have also been remoulded to align with the programme goals and for ensuring increased participation of the stakeholders and partners for sustainability.

**NRM:** In the **Natural Resource Management**, the foundation implemented initiatives for sustainable resource utilization and conservation. The major crops grown in the project districts included paddy, banana and pokkali cum prawn (fish cum paddy). The interventions on farm management led to increase in income of farmers, in 68% of the cases the increase in income was aided by provision of minor agricultural equipment such as rice transplanters which benefitted the farmers in addressing issues of labor shortage. To address issues of drinking water shortage rainwater harvesting units (10,000 Liters) were installed for households who lacked pipe water



connection. The project also focused on disaster management. 91% of the respondents in Alappuzha and 90% respondents in Ernakulam reported that disaster management interventions under HRDP project had lifesaving implications on them.

**Skill Training and Livelihood Enhancement:** In **Skill and Livelihood Enhancement**, MSSRF provided livestock support (quails, ducks) and agriculture tools which enhanced farmers' income. Capacity building activities has empowered farmers. Farmers were provided plant clinic services which continue to help farmers in getting the right information in a timely manner from experts especially in the case of pest attacks, thereby helping in early identification and guiding them on immediate care resulting in minimizing the crop damage. The trainings on climate smart agriculture improved the awareness among farmers. 75 percentage of respondents learnt about conservation agriculture practices through the training programs under HRDP.

Through the HRDP Project, MSSRF has worked with selected enterprises in the project districts empowering community members and generating income especially for women. On comparing the average median income from the enterprise before and after the project, it has been observed that there has been a significant increase in all three sample districts. In Wayanad district, there has been a tremendous increase in average median income by INR 10,000. In Alappuzha, before the project, there was no income generation through enterprises. After the intervention, the average median income from enterprise activity is reported to be INR 5000. In Ernakulam district, there has been a marginal increase in average median income by INR 1000. The project's success in fostering economic activity through enterprises can be seen in the overall increase in total income from all regions, which went from INR 3500 to INR 5500.

**Health and Sanitation:** In **Health and Sanitation**, The kitchen garden initiative aimed to address malnutrition in tribal communities of Wayanad by ensuring food security. Improved nutrition was reported by 18 % respondents implicating improved health of household members. 97 % respondents reported reduced expenditure on food due to which households are now able to sustain with lesser dependence on vegetables in the market. 4% respondents have been able to raise additional income through kitchen gardens by selling the surplus produce in the market.

**Promotion of Education:** For the **promotion of education**, smart class facilities, science labs and language labs were introduced and learning materials were provided to selected schools. 100 % of the students who responded seemed to like learning through smart class facilities. Schools which faced water shortage were provided with infrastructural support such as rainwater harvesting units (Capacity - 50,000 Liters). The interventions were focused on the category of schools known as "aided schools" in Kerala which are often left behind unlike government or private schools. In Wayanad, the tribal hamlet education program aimed to improve educational outcomes in the hamlets.

**Table 1 : Summary of Key Income Indicators**

Income Indicators (based on median)	Before	After	% Change
Average Net Income from Agriculture (INR)	23750	33250	40%
Average Monthly Income from Skill (income from enterprises) (INR)	3500	5500	57%
Average Productivity of 3 major crops (Kg/Acre)	1052	1352	29%
Average Monthly Income from Livestock	4500	8500	89%
Increase in Irrigated Area (in acres)	1	1	0%
Increase in input cost	4650	6000	29%

The above table indicates there is a marginal increase of average net income from agriculture which is primarily due to HDFC interventions. The Average productivity of 3 major crops including paddy, banana and fish cum paddy increased by 29%. There has not been any change in the irrigated land area covered because in the selected clusters, dewatering was required instead of irrigation. Therefore dewatering systems with improved efficiency were promoted by supplying motor pump sets, constructing dewatering unit and supporting rural innovation for more efficient petty – para systems. Average monthly income from livestock increased by 89% due to the relief activities following the Kerala floods and COVID Pandemic. As informed by the respondents there was a slight increase in the monthly income from skill and enterprises by 57% over the project duration.

Overall, the HRDP project in Kerala recognised the distinct requirements of each district and tailored its initiatives accordingly. Emphasis was placed on increasing the availability of drinking water, providing skill development interventions to empower the community, improve health and nutrition through kitchen gardens, and improve educational outcomes by supporting infrastructural developments in schools. Through a multi-faceted approach, the project aimed to catalyse positive and sustainable change in the lives of the residents.

### HRDI Indicators

The table below calculates the Holistic Rural Development Index (HRDI) on the four thematic areas of interventions under the project. While the overall HRDI has 141% increase over baseline, the impact observed to be high in Health & Sanitation with 100% increase over baseline and under skill training and livelihoods with 70% increase over baseline. NRM indicates no growth due to the crop loss made by the farmers during the terminal year of the project.

**Table 2: Summary of HRDI scores**

Domain	NRM		Skill and Livelihood		Health and Sanitation		Education		Total	
	Base line	End line	Base line	End line	Base line	End line	Base line	End line	Baseline	Endline
HRDI Score	0.08	0.10	0.12	0.18	0.24	0.25	0.05	0.10	0.50	0.63
% Change	21%		50%		1%		109%		27%	

# 1. Introduction

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

## 1.1 About HRDP

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

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

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

## 1.2 Objectives of Impact Assessment

The impact assessment aims at understanding:

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

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

It seeks to:

- Critically and objectively evaluate implementation and performance

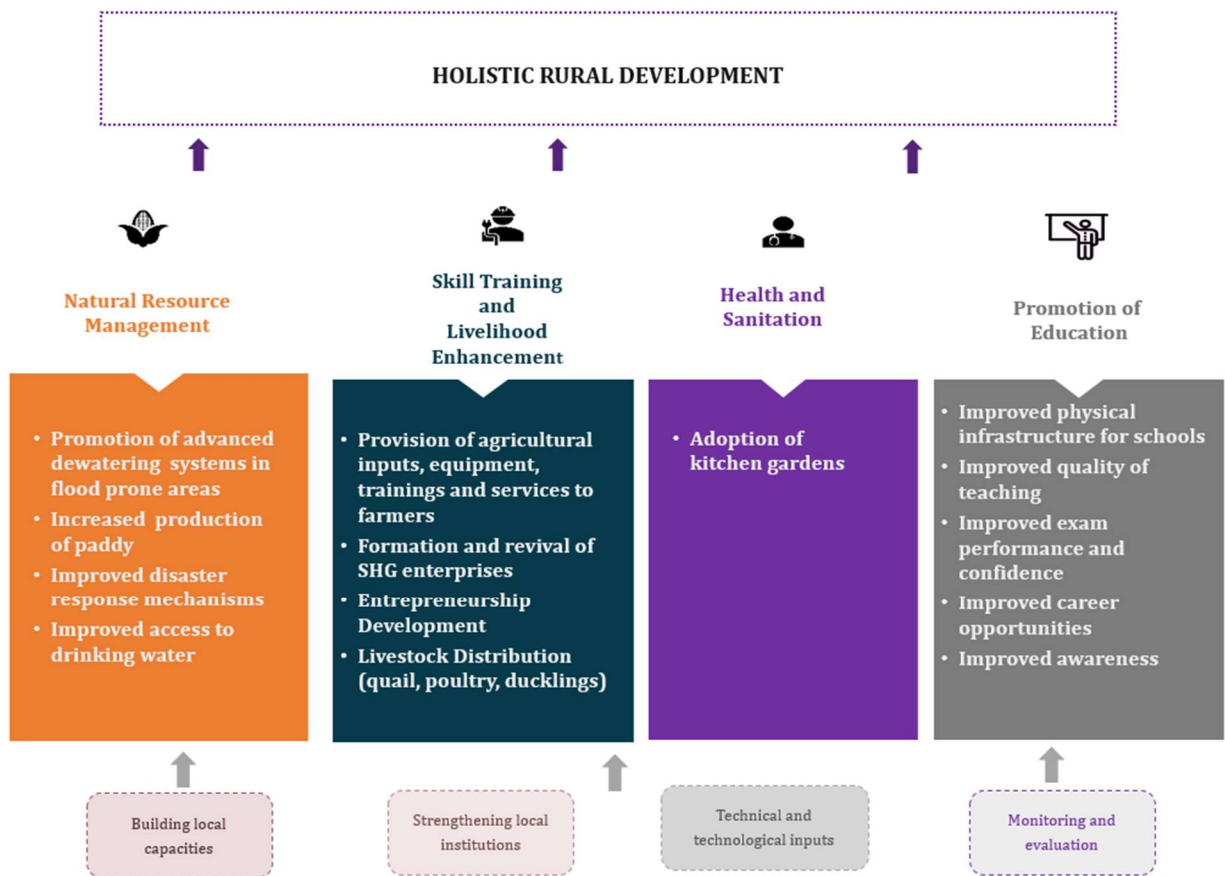
- Determine reasons for certain outcomes or lack thereof
- Derive lessons learnt and good practices
- Provide evidence-based findings to inform future operational and strategic decisions while planning and funding partner organisations

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

### 1.3 Conceptual Framework Adopted

The conceptual framework and the areas covered under the assessment are depicted below (see Figure 1). The aim is to build local capacities and strengthen local institutions, while giving technical inputs and conducting evaluation across the four thematic areas. The objectives under NRM, ST&LE, H&S and PoE are enumerated in the figure below.

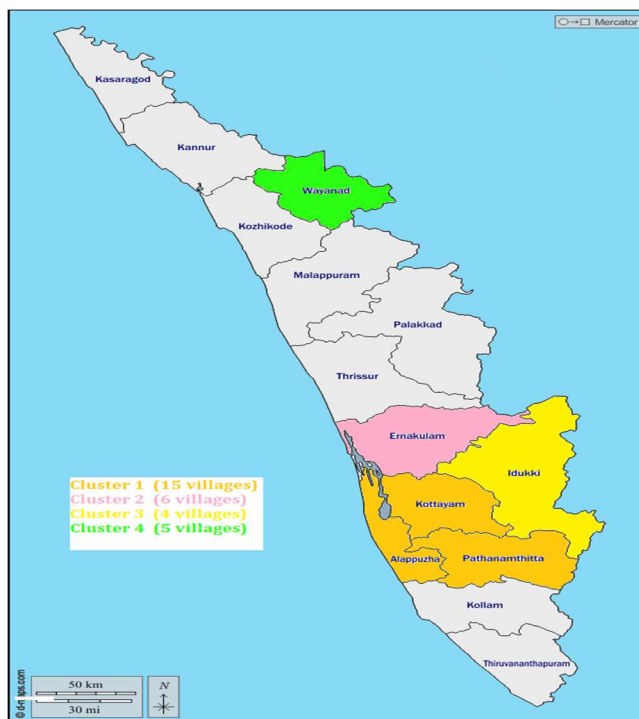
Figure 1 : Conceptual Framework



## 1.4 About the Project Area

The assessment provides an independent, third-party, detailed assessment report of HDFC Bank's HRDP intervention (under *Parivartan*) implemented in Kerala across four clusters covering 6 districts and 30 villages (As indicated in Figure 3) from 2018 -2022.

Figure 2: Areas covered under the study



**Cluster 1 (Kuttanad Cluster):** Covers 15 villages across Alappuzha (8 villages)<sup>1</sup>, Kottayam (5 villages)<sup>2</sup> and Pathanamthitta (2 villages)<sup>3</sup>. The Kuttanad region has the lowest altitude in India, and is one of the few places in the world where farming is carried on around 1.2 to 3.0 meters (4 to 10 ft) below sea level. Farmers of Kuttanad are famous for Bio saline Farming. Food and Agriculture Organization (FAO) has declared the Kuttanad Farming System as a Globally Important Agricultural Heritage System (GIAHS) in 2013. The HRDP interventions in the cluster tried to address issues such as shortage of fresh drinking water, dewatering requirements for cultivation of paddy (*petty -para*), livestock distribution (quails, ducklings) and other livelihood support and entrepreneurship activities.

**Cluster 2:** Covers 6 villages in Ernakulam<sup>4</sup>, including island villages. The HRDP interventions in the cluster focused on supporting farmers who engage in fish cum paddy cultivation wherein they cultivate paddy (*pokkali - indigenous variety*) for 6 months and grow prawns for the next 6 months. In addition to entry level flood relief activities, other interventions included infrastructural support to schools and entrepreneurship development activities.

<sup>1</sup> Kunnumma, Champakkulam, Muttar, Nedumudi, Mullakkal, Pulinkunnu, Ramankary, Veliyanad

<sup>2</sup> Kallara, Thalayazham, Vadayar, Vaikom, Vechoor

<sup>3</sup> Kadapra, Niranam

<sup>4</sup> Chendamangalam, Ezhikkara, Kadamakkudy, Kottuvally, Kunnukara, Puthenvelikkara

**Cluster 3:** Covers 4 villages in Idukki<sup>5</sup>. The HRDP interventions in the cluster focused on supporting farmers, developing women's enterprises and infrastructural support to schools.

**Cluster 4:** Covers 5 villages of Wayanad<sup>6</sup>. The HRDP interventions in the region focused on promotion of kitchen gardens among tribal groups to improve nutrition and supporting tribal education.

### **1.5 About the Implementing Partner - M. S. Swaminathan Research Foundation (MSSRF)**

The M. S. Swaminathan Research Foundation (MSSRF) was established in 1988 as a not-for-profit trust. MSSRF was envisioned and founded by Professor M. S. Swaminathan with proceeds from the First World Food Prize that he received in 1987. The Foundation aims to accelerate use of modern science and technology for agricultural and rural development to improve lives and livelihoods of communities. MSSRF follows a pro-poor, pro-women and pro-nature approach and applies appropriate science and technology options to address practical problems faced by rural populations in agriculture, food and nutrition. Across the years, MSSRF has impacted the lives of over 600,000 families with direct impacts on farmers, fisher folk, tribal groups and women. MSSRF focuses on sustainable agriculture and rural development by adopting knowledge synthesis with strategic production, development and deployment of scientifically credible knowledge and evidence and by developing research innovations with well-designed portfolio.

In 2018, HDFC Bank partnered with MSSRF in Kerala to implement Holistic Rural Development Programme. The HRDP was spread across 30 villages across 6 villages for a period of 3 years ending in 2022 with a major focus on rebuilding rural communities following the devastating effects of Kerala floods and COVID 19 pandemic.

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<sup>5</sup> Idukki, Kanjikkuzhi, Upputhode, Vathikudy

<sup>6</sup> Achhoranam, Kottathara, Panamaram, Pozhuthana, Vengappally

## 2. Research Design and Methodology

The impact assessment used a mixed method that includes both qualitative and quantitative methods to access the impact of the project interventions. The impact assessment process was carried out in a consultative manner engaging with key stakeholders involved in the project design and implementation that includes HDFC Bank and M. S. Swaminathan Research Foundation (MSSRF).

### 2.1 Criteria for Assessment

For each thematic area, project activities completed by the M. S. Swaminathan Research Foundation (MSSRF) were identified from their project documents, reports and MIS that they submitted to HDFC Bank. The impact of those activities were assessed using the following criteria:

- Relevance and Convergence
- Impact and Effectiveness<sup>7</sup>
- Sustainability

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

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

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

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

### 2.2 Primary and Secondary Data Sources

Primary research included a quantitative household survey that was conducted by the survey team consisting of 6 enumerators and 1 supervisor. With backstopping by one field coordinator. The primary

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<sup>7</sup> While from an evaluation perspective impact and effectiveness are two different aspects, in the report, these are used interchangeably.



quantitative data was collected using Computer Assisted Personal Interview (CAPI) method where we developed a mobile application to collect data. The qualitative research included in-depth interviews (IDIs), Key Informant Interviews (KIIs) and Focused Group Discussions (FGDs) with project beneficiaries and secondary stakeholders such as the team members of M S Swaminathan Research Foundation, the HDFC Bank programme team, local leaders from the project area etc. IDIs were conducted with the specific individuals who were recipients of the project. The qualitative data was conducted by our research coordinator.

Secondary data sources included HDFC’s CSR Policy, Programme Log Frame (Logical Framework Analysis), Rapid Rural Appraisal Reports, Programme implementation timelines, Communication, and Documentation products, and other relevant reports/ literature related to the project.

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

### 2.3 Sample Size and Distribution

From the 30 project villages across 6 districts (4 clusters), in 3 districts (11 villages) where the project was implemented, beneficiaries were selected using purposive random sampling from a list of beneficiaries obtained from MS Swaminathan Research Foundation (MSSRF). Since beneficiary selection was undertaken independently for each thematic area, the selection of more than one beneficiary from a single household was probable. Also, there were instances where a single beneficiary received multiple benefits and support across the four thematic areas. Inclusion of beneficiaries for all thematic areas was ensured. The target sample size across the three selected districts was 400, out of which 425 respondents were reached (403 responses for household survey and 22 responses for education survey among teachers and students). Since there was no baseline available for this evaluation, the 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

The thematic area wise sample covered was as follows.

**Table 3 : Sample Distribution across thematic areas (Quantitative)**

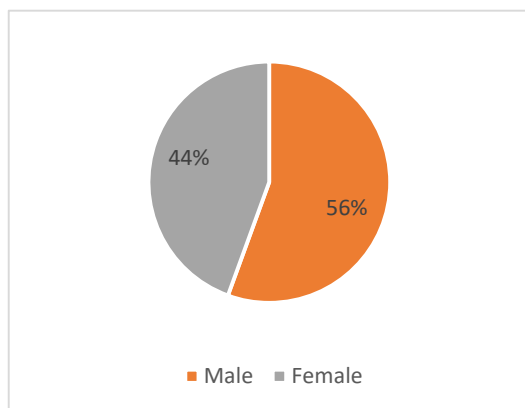
District	Total Households	Natural Resource Management (NRM)	Skill Training and Livelihood Enhancement (ST&LE)	Health and Sanitation (H&S)	Promotion of Education (PoE) <sup>8</sup>
Alappuzha	104	67	47	0	12

<sup>8</sup> The samples for PoE includes households, teachers and students.

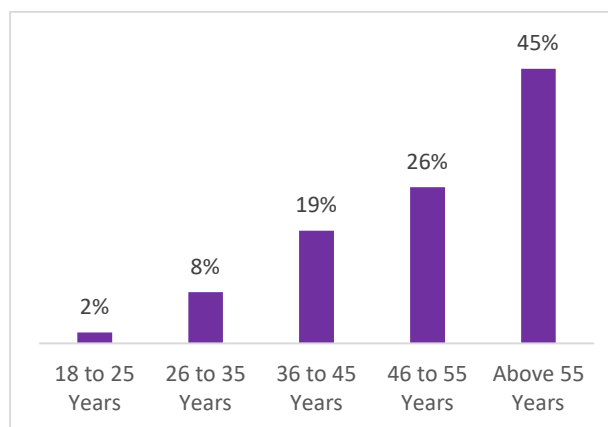


<b>Ernakulam</b>	144	73	95	2	28
<b>Wayanad</b>	155	0 <sup>9</sup>	50	105	0 <sup>10</sup>
<b>Total</b>	403	140	192	107	40
<b>Planned</b>	400	120	115	115	50

**Figure 3: Gender wise distribution of Sample**



**Figure 4: Age Group wise distribution of Sample**



The sample coverage ensures gender representation by covering nearly 56% female and 44% male respondents. In terms of age wise distribution of respondents, while 45% of the respondents belonged to the age group of more than 55 years, 29% respondents belonged to the age group of 18- 45 years. The project had greater focus on elderly population due to the state’s demographic profile and considering their increased vulnerability following the disasters (floods and pandemic) that occurred during the project cycle.

In addition to quantitative survey, qualitative enquiries were conducted through in-depth interviews (IDI) and Focus Group Discussions (FGD) for obtaining information about the different thematic areas as well as to enrich the household survey information with a deeper understanding. In total, 12 IDIs and 8 FGDs were conducted spread across five districts of Kerala (As indicated in Table 4).

**Image 1 : FGD in Progress**



<sup>9</sup> In Wayanad the interventions were reported to focus more on Nutrition gardens and skill enhancement.

<sup>10</sup> The education intervention in Wayanad was limited to tribal hamlet education program. The beneficiaries included tribal children who could not be approached for household survey. Therefore FGD was conducted with children under parental guidance.

**Table 4 : Qualitative sample size covered**

District	FGDs			IDIs			
	<i>Farmers &amp; Livestock owners</i>	<i>Enterprises</i>	<i>Volunteers of tribal education program</i>	<i>Community</i>	<i>Teachers</i>	<i>Village Head</i>	<i>Implementation Partner</i>
Alappuzha	1	1	0	1	1	1	0
Ernakulam	1	1	0	1	1	0	1
Idukki	1	1	0	1	0	0	0
Kottayam	0	1	0	2	0	1	0
Wayanad	0	0	1	0	0	0	0
<b>Total</b>	8			12			
<b>Planned</b>	8			12			

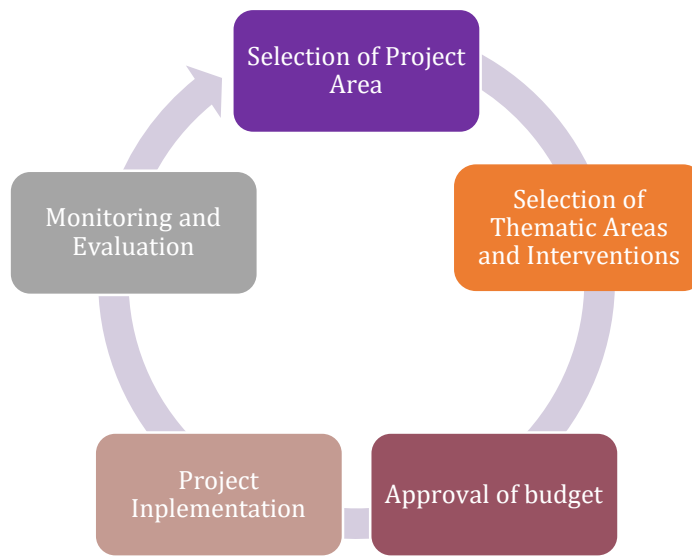
## 2.4 Training of Enumerators

A gender balanced survey team consisting of 6 local enumerators and 1 supervisor recruited with requisite education and experience, for data collection. Three days of training were provided to enumerators and supervisors by the field coordinator and the research coordinator at Ernakulam district of Kerala. During the training the survey team was explained about the project, data collection tools, how to use CAPI, data collection protocols, data quality control etc. The training included both classroom teaching and mock practice of the survey tool.

### 3. Program Planning and Implementation

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

Figure 5 : Planning and Implementation Process



#### 3.1 Selection of Project Area

The selection of program area is primarily based on the existing operational area of the implementing partner. As indicated in section 1.4, HRDP project (under *Parivartan*) was implemented in Kerala across four clusters covering 6 districts and 30 villages. The project was implemented in the context of devastating effects of Kerala floods in 2018 and 2019 further aggravated by the COVID 19 pandemic. In the initial years of the project cycle, the focus was on rebuilding the villages affected by floods, environment restoration, livelihood support and support in education and healthcare for the affected communities. The project prioritized revitalizing ecological balance through community based natural resource management, strengthening local economy through resilient farming systems and improved livelihood opportunities, imparting knowledge to combat with climate change events and financial and social inclusion through participatory implementation. To address the loss of livelihoods among villagers due to the effects of Kerala floods and Covid-19 pandemic, mitigation plans were incorporated to provide immediate livelihood support to those households where the primary breadwinners have lost their jobs or deceased due to COVID.

Farmers in the project districts primarily cultivated paddy, banana and fish cum paddy (*prawns and pokkali variety of rice*). The project also focused on offering hand-holding support to these farmers through trainings and plant clinics, construction of rainwater harvesting units for selected individuals / communities, infrastructural support and capacity building for enterprising units, kitchen gardens for improved nutrition, distribution of livestock, supporting tribal education, etc. Some interventions

have also been remoulded to align with the programme goals and for ensuring increased participation of the stakeholders and partners for sustainability.

### 3.2 Selection of Thematic Areas and Interventions

Considering the above challenges in the project districts in the context of Kerala floods and pandemic induced losses, the MS Swaminathan Research Foundation (MSSRF) under HDFC Bank CSR proposed HRDP interventions focused on promoting water and farm management under Natural Resources Management (NRM) theme. 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; promotion of kitchen gardens under H&S. The activities specific to each village under the project were decided after in-depth consultation with the respective stakeholders. Activities under each of the four thematic areas are as follows.

**Table 5 : Activities under four thematic areas**

Activity Category	Activities	Output Indicators
<b>NRM</b>		
<b>Water Management</b>	<ul style="list-style-type: none"> <li>Dewatering systems (provision of motor pumps for petty – para system)</li> <li>Renovation of ponds</li> <li>Construction of Rainwater harvesting units (individual – 10,000 litres, community – 50,000 litres capacity)</li> </ul>	Income from agriculture
<b>Farm Management</b>	Restoration of second season paddy cultivation	
<b>Disaster Management</b>	<ul style="list-style-type: none"> <li>Flood Relief activities to support lost livelihoods</li> <li>Supply of dry ration</li> <li>Flood mapping and awareness creation</li> </ul>	Reduced Risk and Vulnerability due to natural disasters
<b>ST&amp;LE</b>		
<b>Agriculture Training and Services</b>	<ul style="list-style-type: none"> <li>Agricultural training</li> <li>Support services to farmers through <b>plant clinics</b></li> </ul>	Access to Agriculture Training and Services
<b>Skill and Entrepreneurship Development</b>	<ul style="list-style-type: none"> <li>Provision of infrastructural facilities (building renovation, procuring machinery)</li> <li>Training of women SHG's on skills such as Tailoring / boutique, umbrella making, screwpine craft, coffee shop, flour mill, fish cum paddy based enterprise, etc. (based on the demand form beneficiaries)</li> </ul>	Skill and Entrepreneurship Development
<b>Livestock Management</b>	<ul style="list-style-type: none"> <li>Provided animals (goats, poultry, ducks, quails)</li> <li>Setting up incubation units for quails and poultry</li> <li>Establishing cattle feed mixing unit</li> </ul>	Enhanced Livestock Management
<b>H&amp;S</b>		
<b>Health</b>	Promotion of nutrition / kitchen gardens	Improved Nutrition
<b>PoE</b>		
<b>Educational Institutions Development</b>	Science lab equipment/ Smart class	Infrastructure in Educational Institutions

### 3.3 Project Implementation

HDFC under its CSR initiatives partnered with MS Swaminathan Research Foundation aimed to transform lives in 30 villages spread across selected districts of Kerala for a period of 3 years starting in 2018. The project recognised the distinct requirements of each district and tailored its initiatives accordingly.

Under **Natural Resource Management**, the foundation implemented initiatives for sustainable resource utilization and conservation. To address issues of drinking water shortage ponds were renovated and rainwater harvesting units (10,000 Liters) were installed for households who lacked pipe water connection. Interventions were designed to support dewatering systems in clusters that are prone to floods. This included supply of motor pump sets. In addition rural innovation to improve petty – para system was also supported. Under farm management, restoration of second season paddy, provision of seeds and agricultural minor equipments like rice transplanters with the objective of improving agricultural income. In addition, immediate disaster relief activities to reduce the impacts of the consecutive Kerala floods followed by COVID pandemic and awareness generation for improved disaster preparedness were undertaken.

For **Skill and Livelihood Enhancement**, MSSRF provided livestock management support (distribution of quails, ducks) and agriculture tools which enhanced farmers' income. Capacity building activities were designed to empower farmers. Farmers were provided plant clinic services. Plant clinic sessions continue to help farmers in getting the right information in a timely manner from experts especially in the case of pest attacks, thereby helping in early identification and guiding on immediate care resulting in minimizing the crop damage. The trainings on climate smart agriculture has generated awareness among farmers.

Through the HRDP project, MSSRF has worked with selected enterprises in the project districts empowering community members and generating income especially among women. Support has been extended in the form of **infrastructural facilities** (building construction / renovation, machinery, utensils, furniture etc.) and **training** (on tailoring / boutique, umbrella making, coffee shop etc.) For example, in the cattle feed unit in Ernakulam district, tailoring unit in Idukki, coffee shop in Wayanad, relevant machinery was provided through the HRDP project. The cattle feed mixing enterprise ensured the production of good quality, balanced cattle feed to local dairy farmers through the dairy cooperative while also providing employment to 5 women who were unemployed before. The tailoring unit in Idukki has employed more than 20 women who were unemployed before. The work done with the Screw pine Industry in Kottayam included provision of infrastructural support and capacity building programs to support upcoming screw pine artisans. Support has been extended to selected women owned hotels and catering units by providing furniture and cooking utensils.

In **Health and Sanitation**, The kitchen garden initiative was limited to Wayanad district and aimed to address malnutrition among tribal communities of Wayanad by ensuring food security.

For the **promotion of education**, smart class facilities, science labs and language labs were introduced and learning materials were provided to selected schools. Schools which faced water shortage were provided with infrastructural support such as rainwater harvesting units (Capacity – 50,000 Liters).

The interventions were focused on the category of schools known as “aided schools” in Kerala which are often left behind unlike government or private schools. In Wayanad, the tribal hamlet education program aimed to improve educational outcomes in the hamlets.

Overall, the project emphasized on providing disaster relief, improving water management, enhancing agricultural income, providing skill development interventions to empower farmers , women led enterprises and artisan groups, to improve health and nutrition through kitchen gardens, and improve educational outcomes by supporting infrastructural developments in schools. Through a multi-faceted approach, the project aimed to bring positive and sustainable change in the lives of community members. The implementing partner had positioned dedicated project teams in each project geography who were responsible for project implementation. They also worked in convergence with local governing bodies and state government departments in mobilising communities and helping them in implementing project activities.

### **3.4 Monitoring and Evaluation**

The HRDP has a standard monitoring & evaluation approach that was adopted by the implementing partners. These includes reporting of project implementation progress in periodically to the HDFC Bank. In addition, the program implementation team of HRFC bank visits the project villages at regular intervals to review the project work sites, participates in the training programs, awareness camps and interact with project beneficiaries.

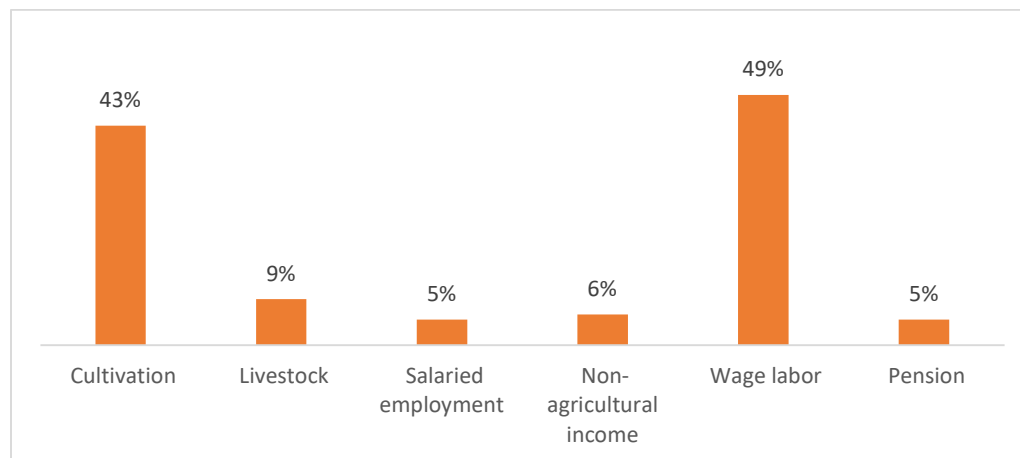
HDFC Bank has specific ask in regards to the project information concerned from the implementing partner. The project data are primarily managed by the implementing partner in spreadsheets that include details of the village wise activities implemented, beneficiaries mapped against each of the project activities, expenditures etc. In addition, the implementing partner submits an annual progress report on the project activities to HDFC Bank along with the plan for the next year. This document serves as the major source of the information that provides a summary of the activities implemented, outputs delivered, and outcomes achieved.

In addition, the HDFC Bank hired NRMC as an external agency to conduct impact assessment of the project after one year of the completion of the project. This is an independent assessment that 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 outcome indicators. The impact of each activity has also been calculated and classified as high, medium, or low impact. The annexure goes into greater detail on these.

## 4. Study Findings

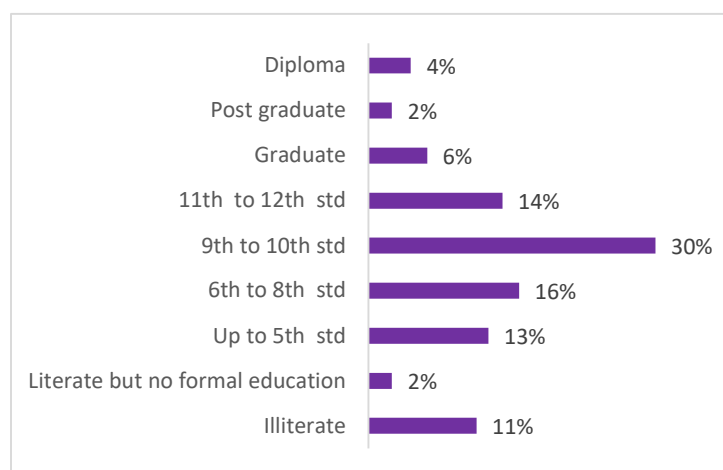
This section provides the analysis of the profile of the respondents covered across three districts in Kerala. Presence of marginal farmers who own less than one hectare of agricultural land and maintain home stead farms of 10-20 cents is a special characteristic of agriculture in Kerala (GoK, 2013). The declining cultivable area, predominance of smaller and fragmented holdings, decline in agricultural labour supply are major challenges facing agriculture in Kerala leading to higher dependency on wage labour across primary, secondary and tertiary sectors.

**Figure 6 : Distribution of Sample based on their occupation**



On analysing the socio economic status of the sample covered, the respondents reported more than one source of income. Over 49 % of respondents reported wage labour as their major income source. This was followed by 43% respondents with cultivation as their major source of income. In addition, 9 % of the respondents reported to have generated income from livestock. 6% of respondents also receive major income from non-agricultural activities such as business or income from rent, 5% reported salaried employment and 5% of respondents attributed their major income source to pension.

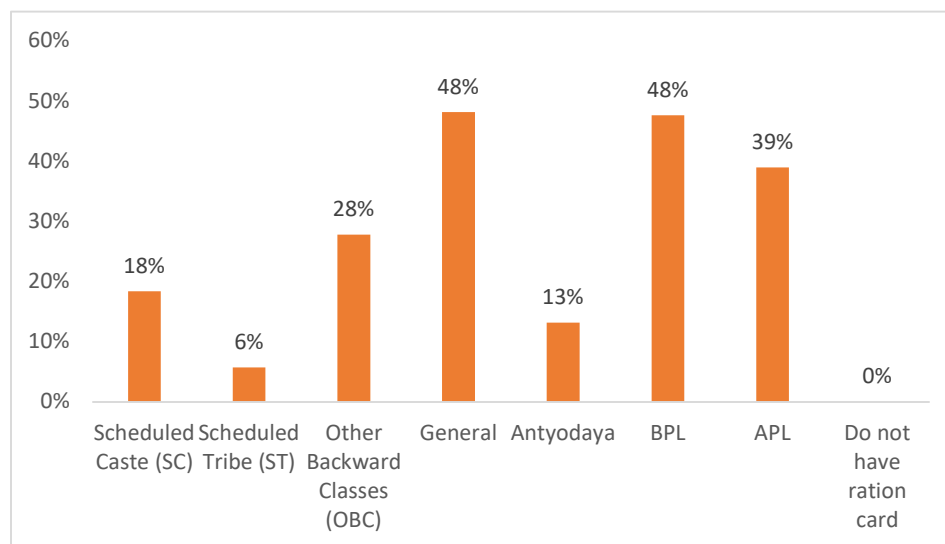
**Figure 7: Educational Qualification wise distribution of the sample**



Kerala in general records high levels of literacy (literacy level of 94% according to population Census 2011). The educational status of the sample is characterised by lower illiteracy levels (11%). 30% of the respondents have completed 9 -10 the standard level of education. 14% respondents have even received higher education. Despite improved educational levels, Figure 6 indicates that only 5% of the respondents regular salaried employment while 49% respondents

depend on wage labour as their major source of income.

**Figure 8: Caste and Income categorization of the sample**



On analysing the caste categorisation, SC, ST and Other Backward classes comprised 52% of the sample while 48% belong to General category. In terms of income categorisation, respondents below the poverty line constituted nearly half of the sample size (48%) while 39% belonged to the

category of above poverty line. All the respondents covered had a ration card.

While the above analysis represents the nature and status of the sample, the following table represents the summary and quantum of activities carried out under each intervention category of the four thematic areas (see Table 8).

**Table 6: Quantum of Activities under each Activity Category of Four Thematic Areas**

Activity Category	Activities <sup>11</sup>	Nos. (as provided by IA)
<b>NRM</b>		
<b>Water Management</b>	• Dewatering systems (provision of motor pumps for petty – para system)	432 farmers
	• Renovation of ponds	4 ponds
	• Construction of Rainwater harvesting units (individual – 10,000 litres, community – 50,000 litres capacity)	15 (10,000 litre capacity) 6 (50,000 Lit. capacity)
<b>Farm Management</b>	Restoration of Paddy cultivation	Minor Agriculture equipment - 1 farmer cluster , 30 farmers
<b>Disaster Management</b>	• Flood Relief activities to support lost livelihoods	4677 beneficiaries
	• Supply of dry ration	
	• Flood mapping and awareness creation	
<b>ST&amp;LE</b>		
<b>Agriculture Training and Services</b>	• Agricultural training	1199 farmers
	• Support services to farmers through <b>plant clinics</b>	1358 farmers

<sup>11</sup> This list is not exhaustive of all the project activities listed by MSSRF. There has been isolated, one time or other entry level activities that were listed but could not be captured effectively due to documentation challenges at the field level.



<b>Skill and Entrepreneurship Development</b>	<ul style="list-style-type: none"> <li>• Provision of infrastructural facilities (building renovation, procuring machinery)</li> <li>• Training of women SHG's on skills such as Tailoring / boutique, umbrella making, screw pine craft, coffee shop, flour mill, fish cum paddy based enterprise, etc. (based on the demand form beneficiaries)</li> </ul>	178 Households
<b>Livestock Management</b>	<ul style="list-style-type: none"> <li>• Provided animals (goats, poultry, ducks, quails)</li> <li>• Establishing cattle feed mixing unit</li> </ul>	242 beneficiaries 1 enterprise unit
<b>H&amp;S</b>		
<b>Health</b>	Promotion of nutrition / kitchen gardens	4200 farmers
<b>PoE</b>		
<b>Educational Institutions Development</b>	Science lab equipment/ Smart class	16 schools

(Source: Project MIS from Implementing Agency)

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

#### 4.1 Natural Resource Management

NRM is one of the most important pillars of HRDP. NRM interventions under the project aimed to address water management issues, disaster management and improving agriculture. Water in Kuttanad cluster and parts of Ernakulam cluster seem to be slightly saline and is therefore unsuitable for drinking directly. The state government supplies pipe water in most of these areas, however leaving out some households due to difficulties in establishing water connection. In addition to supporting renovation of 4 ponds in these areas, MSSRF has been able to support 15 households across 3 districts by constructing rainwater harvesting units (10,000 Liters) through HRDP Program.

The objective of NRM interventions was to improve land/ crop productivity and ultimately increase farmers' agricultural income through increased access to farm management infrastructure and water management systems. The HRDP provision of motor pump sets supported advanced dewatering systems across 278 acres in the low-lying, flood prone areas where cultivation of paddy is done through the local practice of petty – para. The interventions were also designed to support farmers who engage in fish cum paddy cultivation wherein they cultivate paddy (*pokkali* – indigenous rice variety) for 6 months and grow prawns for the next 6 months. The project also focused on immediate disaster relief activities to support lost livelihoods and improve disaster preparedness.

**Table 7 : Activities under NRM in Kerala**

Activity Category	Activities
Water Management	Rainwater harvesting units Dewatering systems (provision of motor pumps for petty – para system)
Increased production of paddy	Restoration of second season paddy cultivation
Disaster Management	Flood relief activities

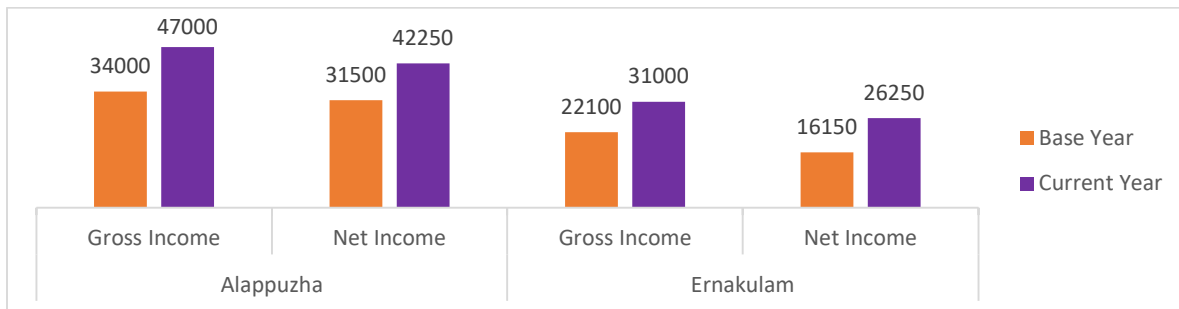
**Image 2: Rainwater harvesting unit in Alappuzha (10,000 Litre capacity)**



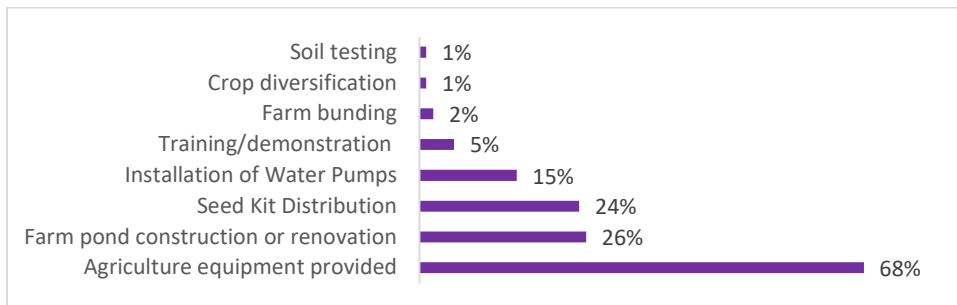
#### 4.1.1 Income from agriculture:

A rise in the agricultural income has been reported in the project areas. In Alappuzha district (Cluster 1) net income increased from Rs. 31500 to Rs. 42250 and the gross income increased from Rs. 34000 to Rs. 47000 while in Ernakulam (Cluster 2) the net income rose from Rs. 16150 to Rs. 26250 and the gross income increased from Rs. 22100 to Rs. 31000. The project's interventions were customised to the agricultural needs of each cluster. The positive change in agricultural income (Figure 9) confirms an improvement in the overall economic well-being of the farming communities.

**Figure 9: Increase in agricultural income (Net and Gross Income) in Rs. (Based on median) (N = 140)**



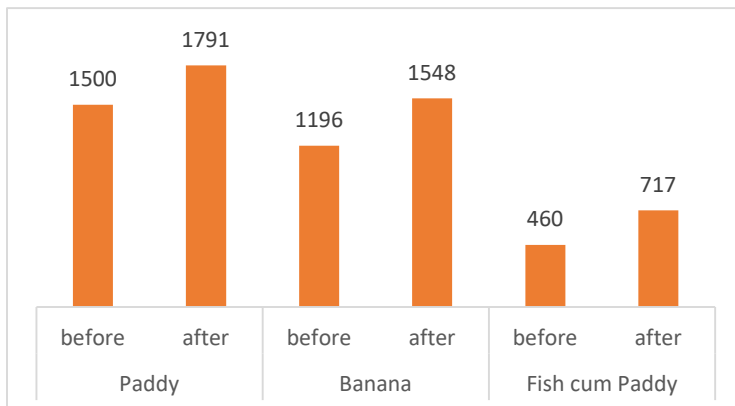
**Figure 10: HDFC interventions helped in increase in the income from agriculture**



Among the HDFC interventions, 68 % respondents have reported that providing minor agricultural equipment such as wheel barrows and rice transplanters have benefitted them by addressing issues of labor shortage. Installation of water pumps is said to have benefitted 15% respondents across cluster 1 and 2 where the water pumps were installed mainly to support the dewatering process. 26% of the respondents reported to have benefitted from Farm pond construction or renovation and 2% respondents predominantly in the Ernakulam cluster have benefitted from farm bunding. 24 % of the respondents have benefitted from distribution of seed kit. Overall, 5 % respondents reported to have benefitted from agricultural training / demonstration.

As part of the HDFC intervention, MSSRF introduced plant clinics which focused on training framers and providing consultation services. During the key informant interviews and focused group discussions, farmers were appreciative of the services offered by the plant clinic as their timely interventions benefitted them during pest infestations. Farmers were also able to access the plant clinic services over phone calls or through the WhatsApp group. However, in the Wayanad district (Cluster 4), the project interventions focussed on kitchen gardens, therefore direct increase in agricultural income was not recorded during the quantitative research.

**Figure 11: Productivity (Median) of major crops per Acre (in kg) (N = 140)**



Most farmers who were covered under the household survey cultivated paddy, banana or fish cum paddy. Following the HRDP interventions, productivity (median) of major crops per acre was reported to increase for paddy (increase in productivity by 291 Kg/ Acre), banana (increase in productivity by 352 Kg/ Acre) and fish cum paddy (increase in productivity by 257 Kg/ Acre).

Fish cum paddy is a unique intercropping strategy practiced in the coastal villages of Ernakulam district and parts of Alappuzha. *Pokkali*, an indigenous, saline tolerant, highly nutritious rice variety is commonly cultivated for 6 months from June to early November when the salinity level of the water in the fields is low. From mid-November to mid-April, when the salinity is high, farmers grow prawns. This sustainable intercropping strategy that has been followed by farmers wherein the prawn seedlings, which swim in from the sea and the backwaters after the rice harvest, feed on the leftovers of the harvested crop. Sluice gates are used to regulate the water flow to the fields. The rice crop, draws nutrients from the prawns' excreta and other wastes therefore ensuring organic and sustainable cultivation of paddy and prawns. During the focused group discussion with *pokkali* farmers, they mentioned that if the season is favorable, *pokkali* is sold at approximately 100 Rs/Kg while farmers are

able to sell prawns at 300 Rs/ Kg or more based on the variety of prawns cultivated, making the latter economically more rewarding. During the qualitative enquiries on field, farmers mentioned that for *pokkali* cultivation they preferred preserving traditionally grown seeds as opposed to genetically modified varieties however, following the floods, their dependency on genetically modified varieties have increased.

**Image 3 : Pokkali field and pokkali grains**

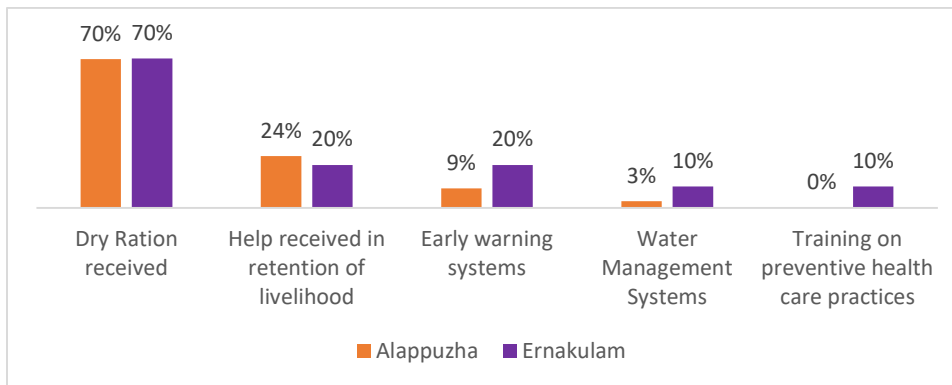


Although pokkali cultivation is very promising, the farmers in the region face several challenges to cultivate the crop which was further aggravated by the Kerala floods. As part of HRDP project, MSSRF supplied prawn seeds in addition to *pokkali* seeds to provide immediate relief to farmers who faced huge crop losses due to floods. Additionally through the project, farmers were also provided support to rebuild the bamboo gates to regulate water levels in the fields and nets to protect bird attacks. They also mentioned that through the intervention, the farmers were provided with superior quality of prawn seedlings in comparison to what is normally available to them. *Pokkali* farmers also face challenges regarding the marketing as the variety is not popularly consumed despite nutritional superiority and organic production process. Additional support in the form of warehousing facility and drying yards would be helpful for them to improve their storage capacity which is extremely crucial considering the traditional preservation of *pokkali* seeds (9 stage process).

#### **4.1.2 Reduced Risk and Vulnerability due to natural disasters:**

As the HRDP project in Kerala was implemented in the context of devastating effects of Kerala floods in 2018 and 2019 further aggravated by the COVID 19 pandemic, in the initial years of the project cycle, the focus was on rebuilding the villages affected by floods, environment restoration, livelihood support and support in education and healthcare for the affected communities. As part of immediate relief support for COVID pandemic which started in early 2020 in Kerala, 70% respondents in Alappuzha and 70% respondents in Ernakulam have reported to have received dry ration to address basic food requirements.

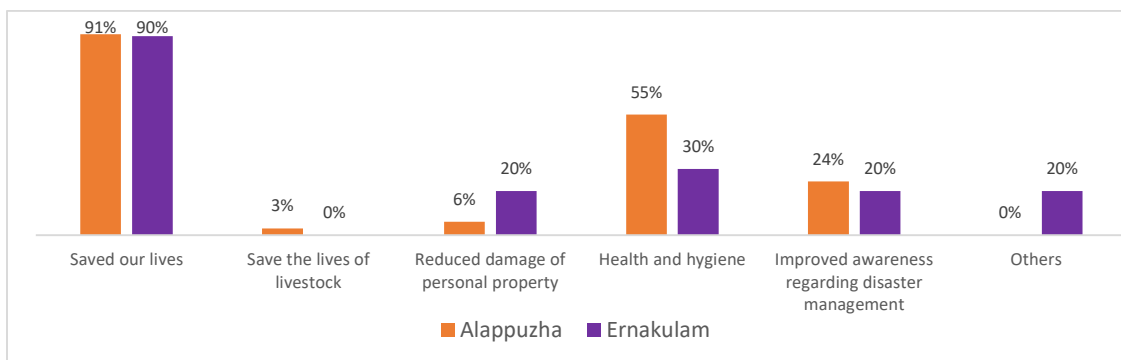
**Figure 12: HRDP support areas in disaster risk reduction (N = 140)**



To address the loss of livelihoods among villagers due to the effects of Kerala floods and Covid-19 pandemic, mitigation plans were incorporated to provide immediate livelihood support to those households where the primary breadwinners have lost their jobs or deceased due to COVID. 24% of respondents in Alappuzha and 20 % respondents in Ernakulam received support in restoring their livelihoods. Based on qualitative interactions, in Ernakulam, livelihood support was particularly extended to dairy farmers in the form of milk bails as they had lost their bails during floods, fisher folk in the form of fish nets as they had lost their fishing equipment during the floods. The Chendamangalam weaver communities had faced enormous loss during the floods. As part of immediate relief, they were provided raw materials for Khadi production. 20 % respondents in Ernakulam and 9 % respondents in Alappuzha have reported to have benefitted from the early warning systems introduced through HRDP.

During field interactions, the respondents mentioned regarding the weather station established in Kottayam. 3% respondents in Alappuzha and 10 % respondents in Ernakulam reportedly received support regarding water management systems in the form of rain water harvesting and dewatering systems. Rain water harvesting units aimed to address shortage of clean drinking water (in areas where water is saline such as islands in Ernakulam and brackish water or areas that haven't received pipe water connections in Alappuzha). The dewatering systems (petty – para system, ground water purification unit etc.) which is not only essential for agriculture but also plays a crucial role in minimizing the impacts of future floods.

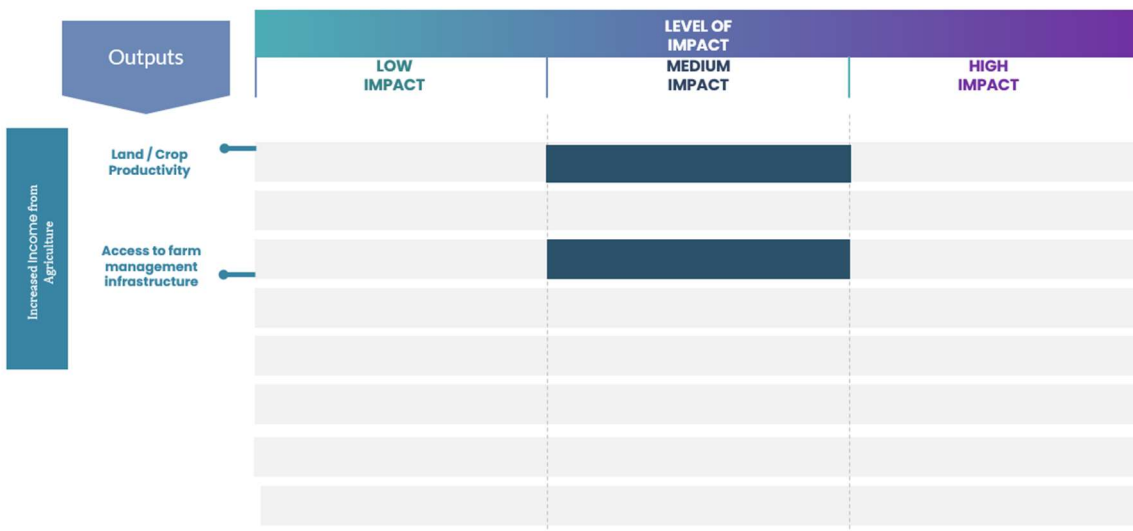
**Figure 13: Perceived benefits of disaster management interventions (N = 140)**



91% of the respondents in Alappuzha and 90% respondents in Ernakulam have reported that disaster management interventions under HRDP project had lifesaving implications on them. 24% respondents in Alappuzha and 20% respondents in Ernakulam reported improved awareness regarding disaster management due to the project interventions. In the context of COVID 19 pandemic, the immediate relief activities had implications on health and hygiene for 55% respondents in Alappuzha and 30% respondents in Ernakulam.

### 4.1.3 Impact Observations

Figure 14: Level of Impact - NRM



Under NRM, crop productivity and improved access to farm management tools record medium impact. Input supply and trainings under plant clinics provided to farmers as part of the project enhanced the crop productivity particularly of paddy, banana and fish cum paddy. Providing minor agricultural equipment like rice transplanter, wheel barrow, motor pumpsets etc. had positive impacts on agricultural income. However, during the project cycle, interventions related to clean energy were not undertaken. However, disaster management related interventions and interventions to strengthen water management systems were undertaken.



#### 4.1.4 Case Study

### Village Pond Renovation and fish farming leading to formation of Farmer Producer Organisation (FPO)

#### Renovated Fish Ponds



In Kanjikkuzhi village of Idukki district as part of HRDP program, fish farming was promoted by renovating and constructing ponds to address loss of livelihood in the context of COVID crisis. A twelve membered women's SHG – AKSHARA, led the renovation and construction of 3 farm ponds. The project provided support for digging, renovation, fencing and tarpaulin for the ponds. In addition, fish seeds were provided and trainings were organised for the SHG members on fish farming. After the renovation of ponds, the SHG members started growing silopia fish in the ponds. They feed the fish with organic household waste. In the year 2021, the SHG had a profit of INR 40,000 through the sale of fish. They are generally able to sell the fish at 150 -200 Rs/ Kg. In the year 2022 however, the profit from fish farming declined to INR 12,000 due to increased availability of the fish variety in the local market. The SHG members are currently planning to explore the cultivation of other fish varieties such as gold fish.

Following fish farming, the intervention also motivated the same SHG members to form a farmer producer group with the support from NABARD to improve the market linkage of agricultural products in Idukki.

#### Focussed Group Discussion with FPO members



The FPO was formed in 2022 focussing on procurement, value addition, and sale and market linkages of spices like pepper, clove, and nutmeg. In addition, they also produce coconut oil, turmeric powder, chili powder etc. The membership fee for the FPO was INR 1000 and it comprises of 10 promoters and 7

directors. The FPO employs 5 women who are part of the AKSHARA SHG. They are paid a monthly salary of INR 12,500. These women feel that by engaging in fish farming, they have become employed in the FPO. In addition to being financially independent, these women find happiness in the work that they do.

## 4.2 Skill Training and Livelihood Enhancement

This section provides an overview of HDFC's work under Skill and Livelihood Enhancement Kerala.

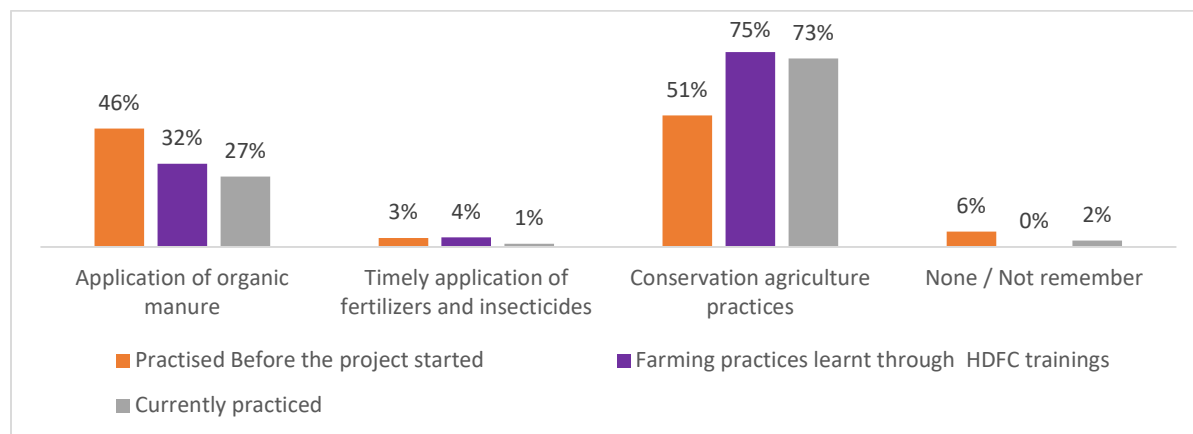
**Figure 15: Activities under skill training and livelihood enhancement in Kerala**

Activity Category	Activities
Agriculture Training and Support	Plant Clinics – trainings and consultation services
SHG-Based Women Empowerment	Establishing/reviving SHG, training for SHG members, establishing/expansion of SHG business
Livestock management	Provision of animals
Entrepreneurship Development	Tailoring/ boutique, screw pine based livelihood, cattle feed making unit, community kitchens, training for business management, support for enterprise development

### 4.2.1 Agriculture training and services:

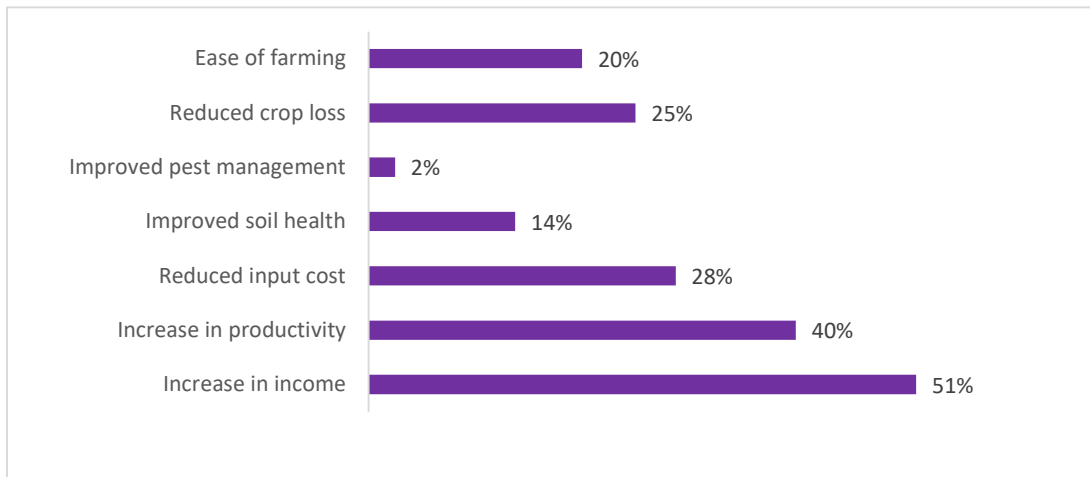
The project carried out initiatives to support sustainable agriculture. Considering the ecological peculiarities of Western Ghats, educating farmers on the climate friendly agricultural practices has been prioritized to ensure ecological, social and economic well-being of communities. As indicated in Figure 16, 75 percentage of respondents learnt about conservation agriculture practices through the training programs under HRDP. The trainings on climate smart agriculture focused on promoting sustainable use of existing natural resources through crop and livestock production systems to achieve long-term higher productivity and farm incomes under climate variabilities.

**Figure 16: Agriculture practices learned through HDFC trainings and currently practicing (N=192)**





**Figure 17: Perceived improvements due to adoption of agricultural practices (N=192)**



Adoption of agricultural techniques have produced a number of perceived improvements in the community (See Figure 17). Sustainable agricultural practices such as use of organic manure have positively impacted crop productivity. 40 percentage of respondents have reported increase in crop productivity. 14 percentage of respondents felt that soil health has improved as a result of sustainable agricultural practices. 25 percentage of respondents have reported reduction in crop loss. 28 percentage of the respondents have reported a reduction in their input cost. 51 percentage of the respondents have reported an increase in income due to adoption of agricultural practices thereby contributing to their economic well-being. 20 percentage of respondents felt that adoption of agricultural practices made farming easier. However, only 2 percentage of respondents felt an improvement in pest management practices due to adoption of agricultural practices.

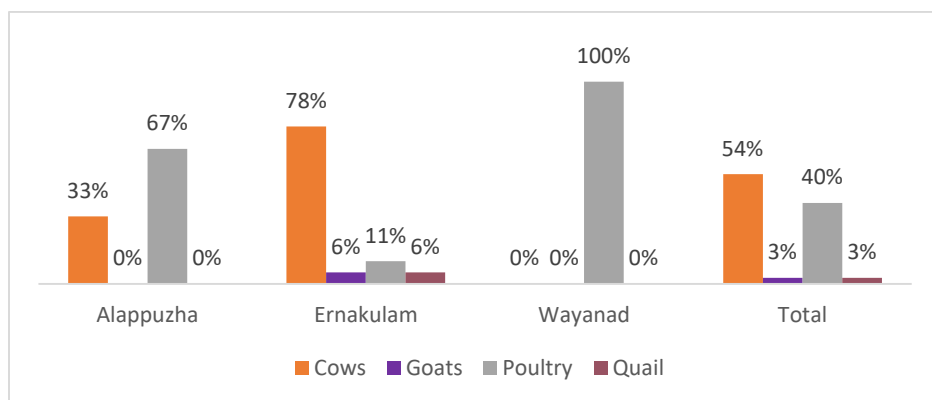
#### **4.2.2 Livestock Management:**

Figure 18 indicates that 54% respondents mentioned cow rearing as a predominant livestock activity across the sampled districts. In addition poultry rearing (40% respondents), goat rearing (3%) and quail rearing (3%) are also popular in the sample districts.

**Image 4: Poultry (from Wayanad)**

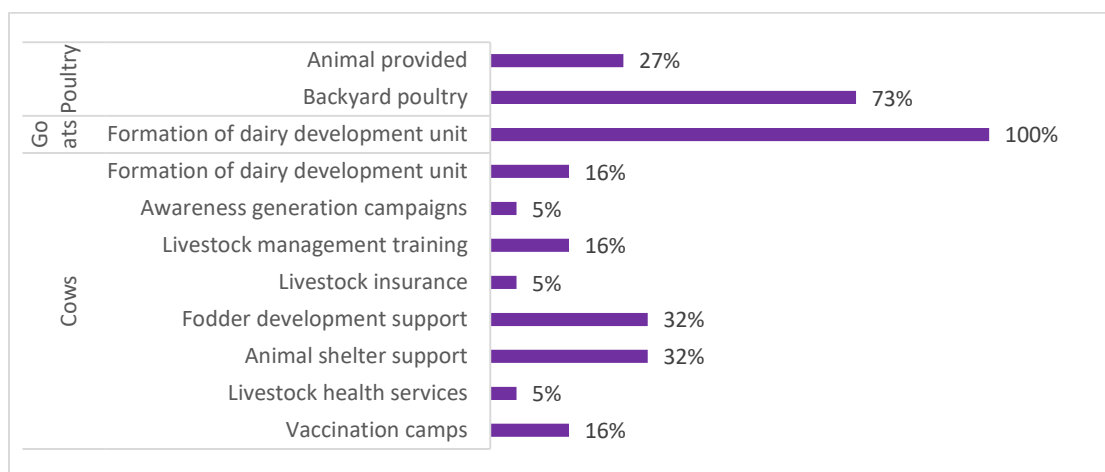


**Figure 18: Proportion of households owning livestock (N=192)**



Livestock distribution was part of the immediate disaster relief plan considering the loss of livelihoods following the floods and the pandemic. Qualitative interviews suggested that livestock management activities were designed based on a convergence model by including respective local bodies and relevant state government departments. In Ernakulam district, 78% percentage of livestock owners own cattle while 33% livestock owners own cattle in Alappuzha. 6% livestock owners in Ernakulam also rear quails while another 6% respondents own goats. In Wayanad, 100% of the respondents covered own poultry in comparison to 67% respondents in Alappuzha and 11% respondents in Ernakulam. During the qualitative interviews, it was noted that in the low-lying regions such as Kuttanad, based on the demand from beneficiaries, instead of poultry, ducklings were distributed to selected households as there was better scope for duck rearing. Quails and goats were also distributed in selected villages.

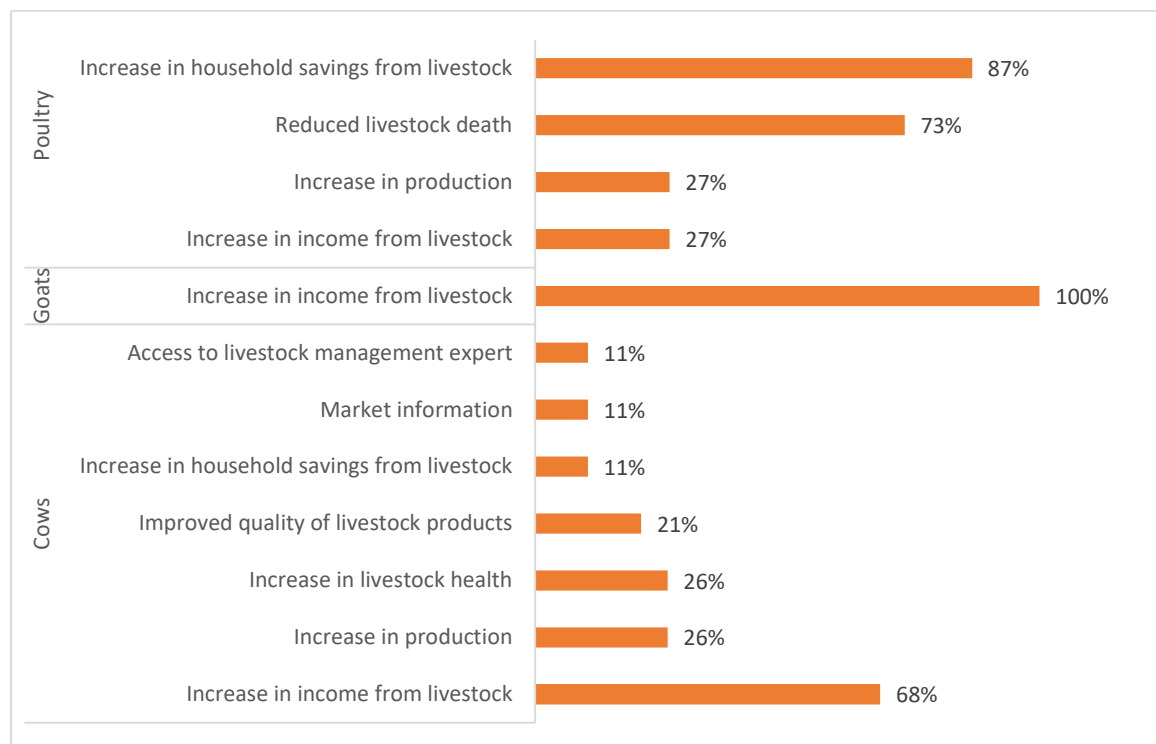
**Figure 19: Livestock services availed by the respondents (N=192)**



As part of the project, poultry was distributed to 27% of the respondents. 73% of the respondents focused on backyard poultry rearing. 100% goat owners and 16% cattle owners reported to have received support in formation of dairy development unit. During qualitative interviews the respondents mentioned that MSSRF had worked closely with the dairy cooperatives to design activities that ensure the welfare of cattle. The project interventions contributed towards empowering existing

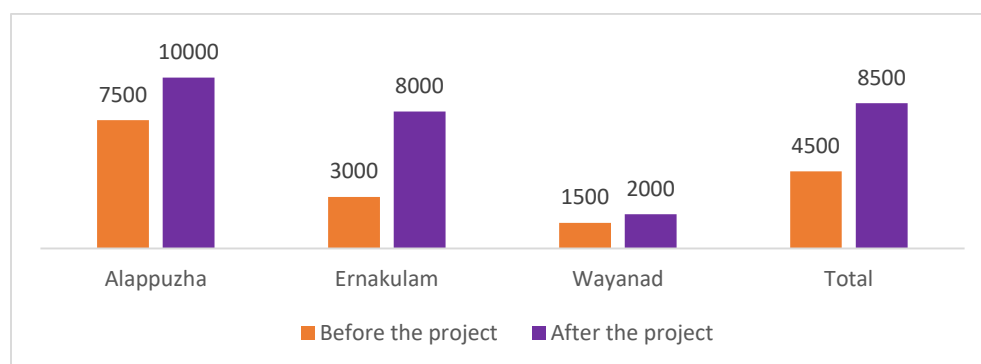
dairy cooperatives, through awareness generation campaigns (availed by 5% respondents), training programs (availed by 16% respondents) and provision of livestock health services (availed by 5% respondents) such as helping livestock rearers connect with veterinary doctors. 16 % respondents mentioned to have availed services such as vaccination camps led by the dairy cooperatives. In addition, cow beds made of rubber were provided to prevent infections such as foot and mouth disease in cattle. Notably, through the HDFC support, one cattle feed development enterprise was formed to provide fodder development support to dairy farmers at subsidized costs.

**Figure 20: Primary benefits of livestock services (N=192)**



Households owning poultry saw an increase in production in 27 % of the cases. 27 % households recorded an increase in income by rearing poultry while 87% saw an increase in household savings. The poultry death rates were reported to be reduced by 73% of beneficiaries. Goat rearing appears to have contributed to an increase in income from livestock in all reported cases. Empowering dairy development units have significantly benefitted goat owners. Cattle rearing has also contributed to an increase in income in 68% of the cases while increase in production was reported by 26% respondents. 11 percentage of respondents saw an increase in household level savings through cattle rearing related interventions. The awareness campaigns and training programs conducted in collaboration with the dairy cooperatives resulted in increase in livestock health (26% cases), improved quality of livestock products (21% cases) and improved access to livestock management experts (11% respondents). 11 percentage of dairy farmers mentioned to have received accurate market information through these programs.

**Figure 21: Change in monthly income from livestock (based on median) (in INR) (N=192)**



Households have reported that 53% of their current monthly income (median) comes from the livestock activities which were supported by HDFC Bank Project. Across the three sample districts, increase in monthly income from livestock has been reported. In Alappuzha, an increase in monthly income by INR 3500 was reported while an increase of INR 5000 was reported in Ernakulam and an increase of INR 500 was reported in Wayanad. Overall an increase in median monthly income of INR 4000 was reported after the project interventions on livestock management. However, during the focused group discussions, some beneficiaries mentioned that increase in the price of feed for birds (poultry, quail, ducks) has led to increase in cost of production. Earlier on, ducks fed on black soldier worms and other larva. Due to rapid biodiversity loss in the Kuttanad cluster resulting from increasing use of pesticides and insecticides in the paddy fields, livestock rearing now heavily relies on purchasing feed from the market.

#### **4.2.3 Economic Empowerment through collectivization:**

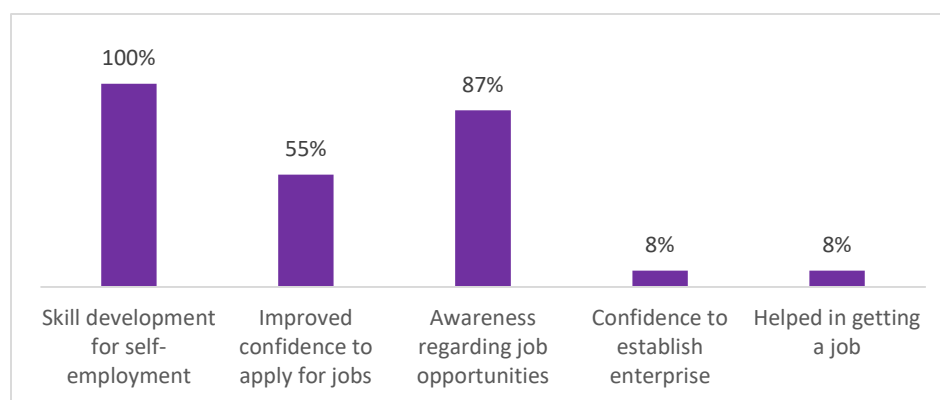
As part of the HRDP project in Kerala, efforts have been taken to establish enterprise groups, expand the scope of existing SHG led enterprises and revive SHG led enterprises which were earlier formed as part of the Kudumbashree mission to enhance economic empowerment among women. According to Figure 22, 30 percentage of the respondents received support in establishing group enterprises while 4% of the respondents received initial capital investment in the form of physical assets or machinery. 22 percentage of the respondents mentioned that they were provided information on production techniques and practices to improve their efficiency. Training on business management including book keeping was recalled by 7 percentage of the respondents.

The interventions under HRDP project focused on improving the economic opportunities for the SHG's by providing marketing support as reported by 26 percentage of respondents. 30 percentage of the respondents mentioned to have received support in linkages with bank thereby enhancing their financial access. 7% respondents received support in linking with other firms.

**Figure 22: Support Provided for Groups through HRDP (N=192)**



**Figure 23: Perceived benefits of training provided under the Project (N=192)**

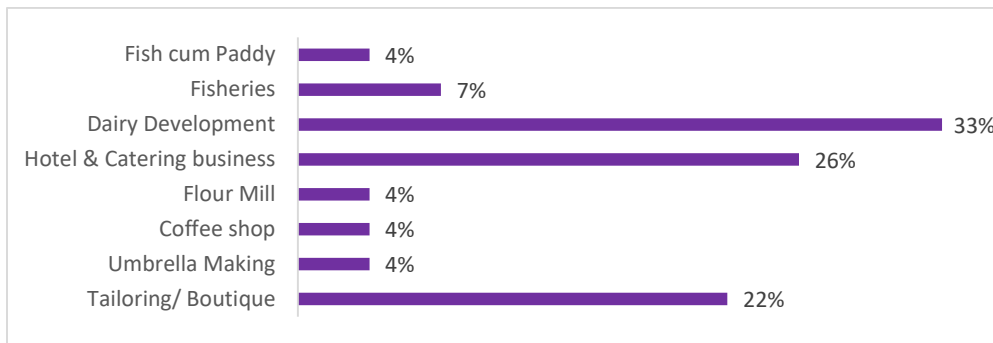


The trainings provided as part of the HRDP program had positive impacts on the beneficiaries. Under the project, expert led trainings were provided for skill development depending on the type of enterprise such as umbrella making, tailoring and boutique, coffee shop, handicrafts etc. 100 percentage of the respondents who participated in the evaluation process responded that the trainings received significantly contributed towards skill development for self-employment. 87 percentage of the respondents mentioned that the trainings helped generating awareness regarding job opportunities. 55 percentage of the respondents gained confidence to apply for jobs through the trainings. However, 8 percentage of the respondents gained the confidence to establish enterprises while 8 percentage of respondents were able to secure jobs based on the training.

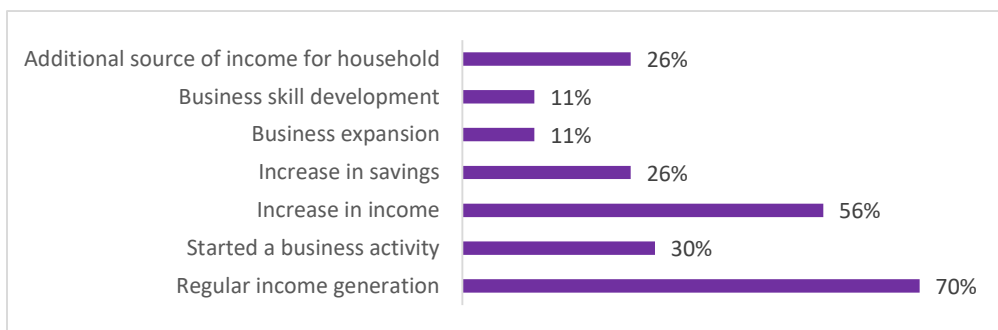
#### **4.2.4 Skill and Entrepreneurship Development:**

HDFC project has contributed positively towards skill and entrepreneurship development. Currently, 33 percentage of the respondents are engaged in dairy based enterprises, while 26 % of the respondents are engaged in hotel and catering business. 22 percentage of respondents are engaged in tailoring / boutique. Respondents are also involved in fisheries (7%), umbrella making, (4%), coffee shop (4%), Flour mill (4%) and fish cum paddy based enterprise (4%). Fish cum paddy based enterprise is region specific and is operational in Ernakulam district.

**Figure 24 : Enterprise/small businesses respondents are currently involved (N=192)**

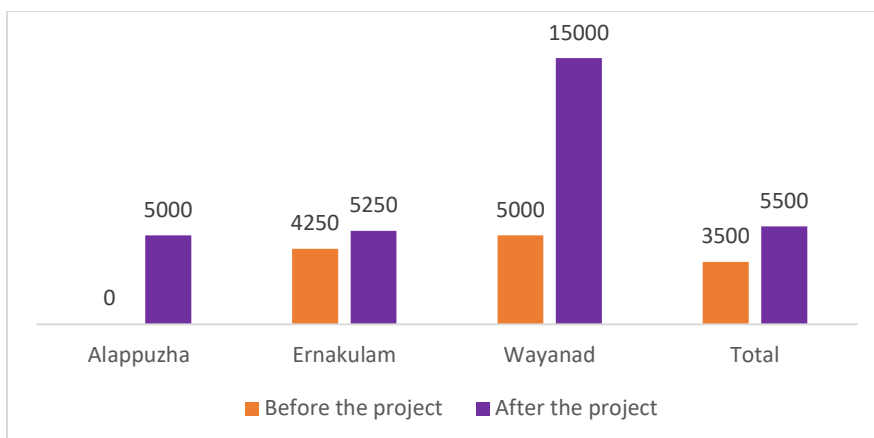


**Figure 25: Benefits gained through project support in enterprise development (N=192)**



The project interventions on enterprise development have contributed towards economic empowerment of communities as indicated by 56% of the respondents who saw an increase in their income. Through the project interventions, 30 percentage of respondents started being part of business activities while 70 percentage of the respondents started receiving regular income through enterprises. 11 percentage of respondents were able to expand their business due to support from HDFC project. 26 percentage of respondents have been able to generate additional income through business activities. 26 percentage of respondents reported an increase in their savings by being involved in business activities. In the case of 11% of respondents, their business skills have developed as part of the project interventions.

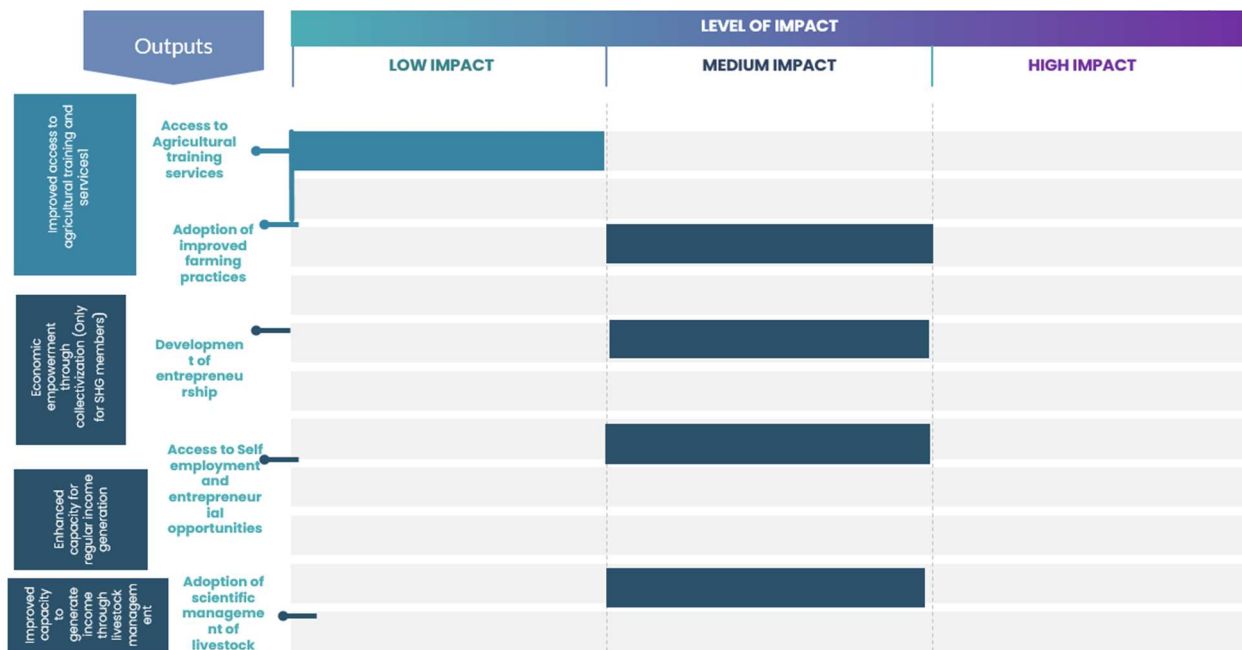
**Figure 26: Average income from the enterprise before and after project inception (In INR) (N=192)**



On comparing the average median income from the enterprise before and after the project, it has been observed that there has been a significant increase in all three sample districts. In Wayanad district, there has been a tremendous increase in average median income by INR 10,000. In Alappuzha, before the project, there was no income generation through enterprises. After the intervention, the average median income from enterprise activity is reported to be INR 5000. In Ernakulam district, there has been a marginal increase in average median income by INR 1000. The project's success in fostering economic activity through enterprises can be seen in the overall increase in total income from all regions, which went from INR 3500 to INR 5500.

### 4.2.5 Impact Observation

Figure 27: Level of Impact – ST & LE



Access to agricultural training and services under ST & LE records low impact. On asking the learnings from the trainings, respondents were finding it difficult to recall specific learnings or interactions. Adoption of improved farming practices were focused as part of the project and has shown medium impact under ST&LE. Development of entrepreneurship, Access to self-employment and entrepreneurial opportunities and adoption of scientific management of livestock have also shown medium impact.



## 4.2.6 Case Study

### Vaikkom Tazha : Weaving dreams from Screw pine

#### Conversation with Screwpine Artisans



Screwpine (*pandanus*) craft is a traditional cottage industry in Kerala which predominantly employs women. Screwpine leaves are traditionally used to weave mats and other handicrafts thereby providing opportunity to develop ecofriendly livelihoods to empower local communities. As part of HRDP program in Vechoor, Kottayam district, screwpine based livelihoods were promoted. The intervention focussed on revival of the upper society (*Kottayam Jilla Mahila Tazha Paya Vikasana Federation Samithi*) that was formed in 1998 and has 10,000 members. The society started its activities by providing educational scholarships for children of artisans and slowly collectivised artisans from across the district. The members belonged to the age group of 30 - 60 and paid a membership fee of Rs. 25 and passed a skill test based on which an ID card was issued by the Ministry of Textiles.

However, once their secretary passed away in 2016, the society became inactive. Artisans started engaging in wage labour or NREGA thereby giving up on screw pine craft. Besides, scarcity of screwpine for craft and limited market linkage discouraged other artisans from continuing the craft.

Under Parivarthan program initially, 5000 screwpine sapplings were distributed in 2018 to revive screwpine based craft. The project also supported the establishment of a pre fabricated building which is now used as the common facility centre for screwpine processing and training in Vechoor. Experienced artisans and resource persons organise training sessions covering a range of topics from growing screwpine to weaving, product standardisation and marketing at the centre. In 2021, nearly 30 women were trained in screwpine craft 50% of whom are continuing it as an additional source of income. With guidance from MSSRF, the society has been able to achieve product diversification, product standardization, improve branding, marketing and initiate social media presence. They have customised products for confrences and events as well. Their overall annual turnover was reported to be around 1lakh INR.

#### Some Standardized Products



They have around 25 products including mats , doormats, purses, files, wall hangings, bed mats, yoga mats, bags, hats etc. For each product developed, the artisan pays a commission to the society which is mutually agreed upon. These funds are utilised for the regular operations of the society. As part of the project, the unit has also been linked with local resorts and agriculture theme park wherein some of the members are invited to teach screwpine craft to tourists and simultaneously sell their products or exhibit them thereby improving market potential.

### Social media presence



Women from vulnerable communities who got married very young or women from conservative family backgrounds particularly benefitted from the society as they could stay inside their homes and finish the work during their free time. Once the final product is ready, they can bring it to the centre or sell it locally. Many women see screwpine craft as an additional income source. In addition to economic empowerment by learning and practising a new skill, these women have found freinship, increased confidence and happiness from the craft.

The society envisions to expand the scope of screwpine, get enough, sustainable work for members to be engaged full time, improve infrastructural facilities like getting a dryer, improving their marketing strategies and promoting screwpine as an alternative and ecofreindly solution to artificial products.

## 4.2.7 Case Study

### Tailoring Unit to Empower women



In 2020, under HRDP project, 8 women members on Mannan tribal community were identified and provided training sessions on tailoring. Through the project they were provided tailoring machines (electrical and manual), cutting machine, embroidery machine, iron box, tailoring chair, cutting table and other tailoring equipments. The training also covered tailoring, stitching, managing group activities and accounts. One members have a diploma in fashion designing. She leads the curriculum design for the training program. Thirty young women trainees completed three month training course in the centre as of March 2022. The total group income as of March 2022 was 18,000 INR. In addition to financial independence, women who are part of the unit are able to contribute to their children's education. They have found strength, improved confidence and happiness through the collective. The unit has tied up with Kudumbashree mission and plans to link with Start up Village Entrepreneurship Program (SVEP).



#### 4.2.8 Case Study

##### Kovilakam Feeds: Cattle Feed Mixing Unit to enhance Livestock health



To address the issue of lack of availability of balanced cattle feed at affordable prices, which affected the nutrition of cattle and therefore the quality of milk a cattle feed mixing unit was established under HRDP Project in Chendamangalam village of Ernakulam district. In 2020, the HRDP project identified a five – member women group of Kottayil Kovilagam Milk Production Society. The group was provided with a conveyer, a trolley, 7KV Generator for mixing, weighing and packing. They developed their own formula for mixing raw materials like maize powder, calcium powder, ginger, salt etc. to produce balanced cattle feed. Earlier, cattle feed was produced in powder form.

Currently the unit is able to produce feed pellets due to the availability of new machinery provided under the project. Cattle feed is sold to dairy farmers at a price of 920 Rs/ bag. Currently they are able to sell nearly 1400 bags of cattle feed every month for which they earn a profit of Rs.30 / bag. Their average production cost including labor charges come upto 890 Rs/ bag. Cattle feed is sold to dairy farmers who are members of the dairy cooperative at subsidised rates.

The cattle feed unit aims to promote self sufficiency in the dairy sector at the village level. It provides employment opportunities to women and has improved the lives of 5 households. One of the workers at the unit, Ms. Sibi says, “ I have never earned a regular income before joining the company. Today I am earning 18,000 Rs on a monthly basis. I am able to support my family and educate my children. Moreover, I enjoy self independence which I never had before. I wish more women were able to come and work here.”

### 4.3 Health and Sanitation

Interventions in the health and sanitation sector has been limited to kitchen gardens mostly in Wayanad district.

#### 4.3.1 Kitchen Garden:

Figure 28: Activities under skill training and livelihood enhancement in Kerala

Activity Category	Activities
Kitchen Garden	Seeds, trainings

Figure 29: Project support received for kitchen garden (N=107)

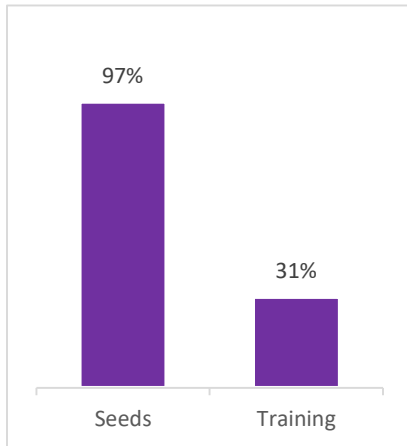
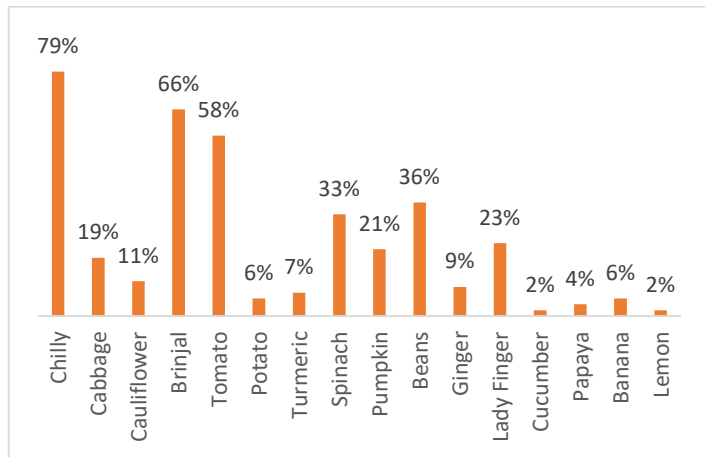


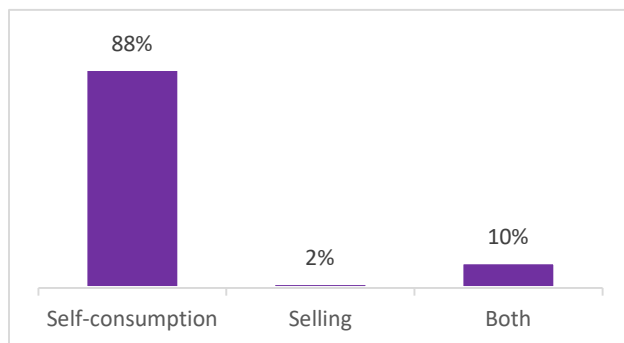
Figure 30: Fruits / Vegetables for which support was received (N=107)



As part of the project, kitchen gardens were promoted with a specific focus among the paniya tribal community in Wayanad. The intervention aimed to address nutritional needs among tribal communities through kitchen gardens. The project support included distribution of seeds (97% households) and provision of training (31% households). 79 % respondents received support for the cultivation of chilly, 66% respondents for growing brinjal and 58% respondents for growing tomato.

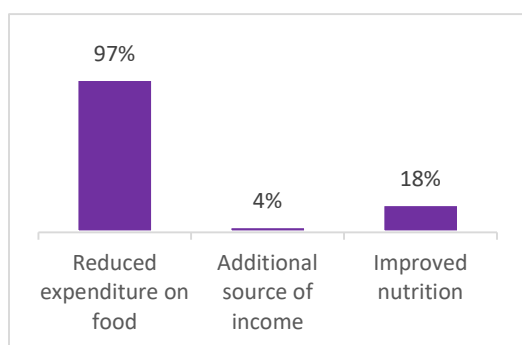


**Figure 31: Use of produce from the kitchen garden**



88 % of the respondents consume the produce from kitchen gardens for their household requirements. 2% respondents engage in the sale of produce from the kitchen garden. 10 % respondents are able to consume the produce from kitchen garden and sell the surplus produce.

**Figure 32: Perceived benefits of HRDP supported kitchen gardens**

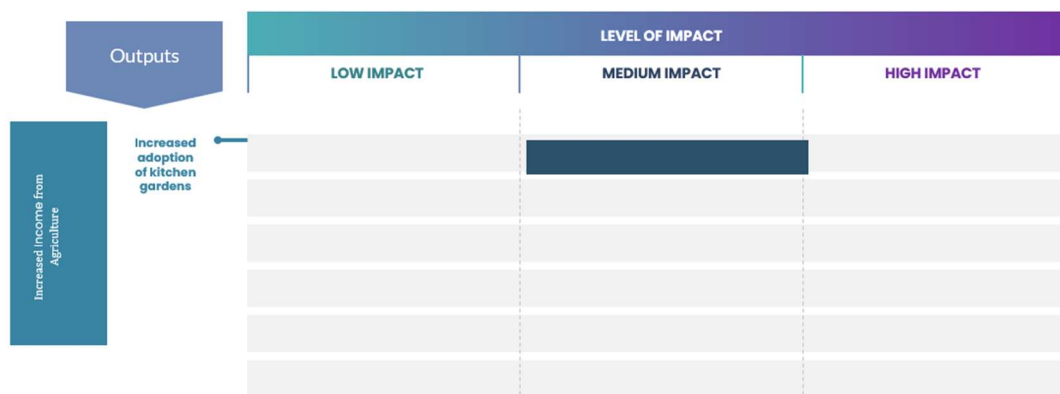


The kitchen gardens seem to have positively impacted the beneficiaries in terms of food security and economic empowerment. Improved nutrition was reported by 18 % respondents implicating improved health of household members. 97 % respondents reported reduced expenditure on food due to which households are now able to sustain with lesser dependence on vegetables in the market. 4% respondents have been able to raise additional income through kitchen gardens by selling the surplus

produce in the market. By selling the produce in the market, respondents are able to earn a median income of Rs. 250 on a weekly basis. For furthering the benefits from the kitchen garden intervention, 67% respondents reported need for additional support in the form training while 33% respondents mentioned the need for more inputs.

### 4.3.2 Impact Observation

**Figure 33: Level of Impact - H & S**



Under H&S, medium impact was observed under promotion of kitchen gardens.

## 4.4 Promotion of Education

To promote educational outcomes, the HRDP project in Kerala focussed on supporting infrastructural additions in selected schools. Government aided category of schools in Kerala are known to receive limited support from the government. Several project villages, had only the government aided category schools. Therefore, the project interventions were directed towards selected government aided schools that lacked in basic infrastructural facilities to support the student’s educational needs.

**Figure 34: Activities under education in Kerala**

Activity Category	Activities
Education Support	Language lab, smart class, learning materials

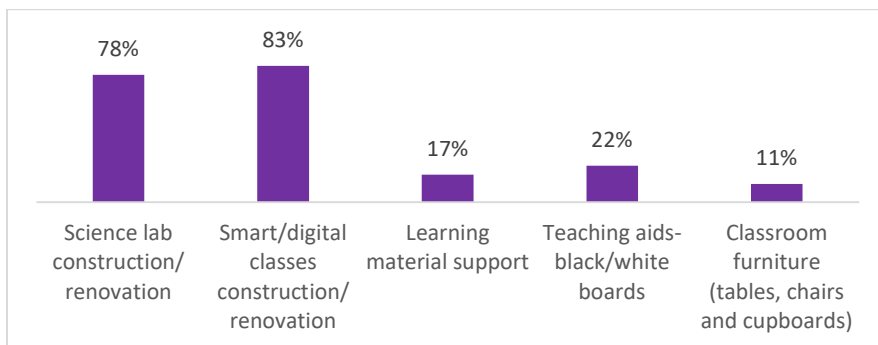
### 4.4.1 Infrastructure in Educational Institutions

Science labs and Smart classes were provided in some schools in the project villages. Learning materials and books for the school’s libraries were also provided to the students. Teaching aids and classroom furniture were also provided in selected schools.

**Image 5 : Infrastructural Support to Schools (N =40)**



**Figure 35: Type of infrastructural support provided to schools (N=40)**

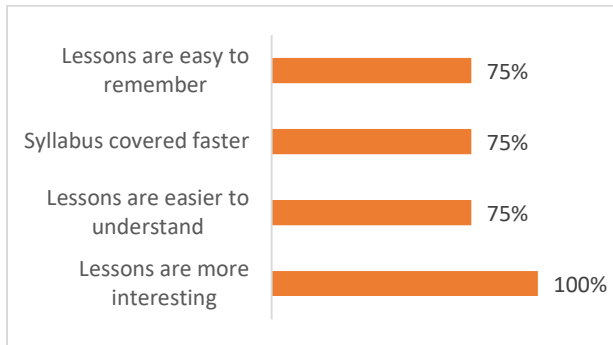


Students believed that smart classes offered a variety of advantages with the smart class facilities. All the students who participated in the survey found lessons more interesting, 75% students found it



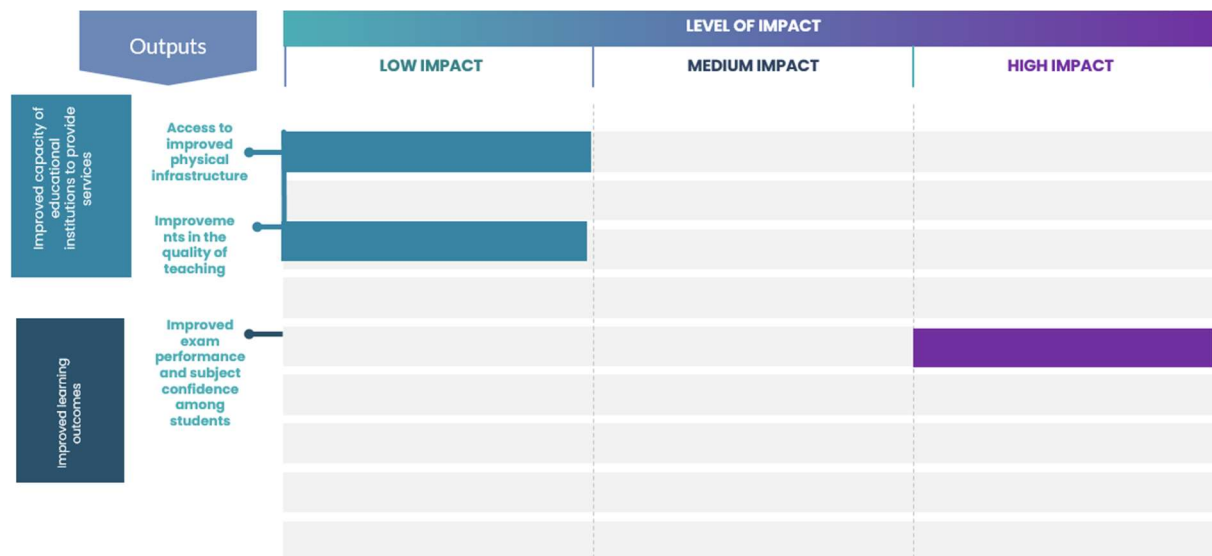
easier to understand the lessons and easier to remember the lessons. 75% students also reported that syllabus was getting covered faster by using smart class. 100 % of the students who responded seemed to like learning through smart class facilities.

**Figure 36: Perceived benefits of smart class (N=40)1**



#### 4.4.2 Impact Observation

**Figure 37: Level of Impact - PoE**



Under PoE, high impact could be seen in improved exam performance and subject confidence among students. However, access to improved physical infrastructure and improvement in teaching quality has been recorded to be of low impact. The challenges with the school infrastructure is that these are sometimes, developed or constructed in isolation without considering and aligning with the overall infrastructure of the school. Moreover, frequent transfers of job teaching staff hinder improvements in teaching quality.

### 4.4.3 Case Study

#### Wayanad: Community volunteers for the Hamlet level Education Program



With the aim of supporting Paniya tribal community of Wayanad in improving their children's educational outcomes, a hamlet level education program was launched. In 2019, under the HRDP program, volunteers were identified in selected hamlets. The project mobilized tribal promoters, panchayat representatives, local teachers and students. Regular evening classes were undertaken at the hamlet level by community volunteers with the support of local resource persons. During the COVID 19 pandemic, the volunteers continued their interactions with the students. Nearly 127 students in the age group of 5 -17 in five selected hamlets were brought back to regular studies. School attendance levels of these children improved from 34% to 83% in 2020. In addition, students also mentioned that their interest in learning has improved and teachers in regular schools have started paying more attention to their learning needs.

## 5. Analysis of Assessment Criteria

As outlined earlier in 0, for each thematic area, activities completed by the MS Swaminathan Research Foundation were identified and assessed using the following criteria:

- Relevance and Convergence
- Impact and Effectiveness<sup>12</sup>
- Sustainability

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

### 5.1 Relevance and Convergence

Kerala is more vulnerable when it comes to climate-induced disasters especially being in the Western Ghats region. In August 2018, Kerala received an extended period of very heavy rainfall as a result of a low-pressure system near the beginning of the month being followed several days later by a monsoon depression. The devastating flood and associated landslides affected 5.4 million people and claimed over 400 lives while displacing nearly one million people from their homes. The post-disaster assessment commissioned by the Government of Kerala estimated the economic loss to be more than \$3.8 million (Hunt, 2020). The HRDP project in Kerala aimed to address the impacts of two major floods in 2018 and 2019 followed by COVID 19 pandemic in 2020 on the lives and livelihoods of local communities. The interventions aimed to provide immediate relief to communities which were highly affected by the disasters while simultaneously rebuilding the environment.

The interventions spread across 4 clusters (covering 6 districts and 30 villages) and recognised the distinct requirements of each district based on which interventions were customized. Emphasis was placed on increasing the availability of drinking water, providing skill development interventions to empower the community, improving health and nutrition through kitchen gardens, and to improve educational outcomes by supporting infrastructural developments in schools. Through a multi-faceted approach, the project aimed to catalyze positive and sustainable change in the lives of the residents.

### 5.2 Sustainability

NRM interventions under the project aimed to address water management issues, disaster management and improving agriculture. The foundation implemented initiatives for sustainable resource utilization and conservation. To address issues of drinking water shortage rainwater harvesting units (10,000 Liters) were installed for households who lacked pipe water connection. Advanced dewatering systems were promoted and agricultural inputs were supplied to farmers. There has been a rise in the agricultural income in the project areas indicating the improved welfare of farmers in the region.

Under ST&LE, the programme made significant strides in addressing the disaster induced loss of livelihoods. Livestock support (quails, ducks, poultry, cattle, goats) and agriculture tools which enhanced farmers' income. Capacity building activities has empowered farmers. Farmers were

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<sup>12</sup> While from an evaluation perspective impact and effectiveness are two different aspects, in the report, these are used interchangeably.

provided plant clinic services. Plant clinic sessions continue to help farmers in getting the right information in a timely manner from experts especially in the case of pest attacks, thereby helping in early identification and guiding on immediate care resulting in minimizing the crop damage. The trainings on climate smart agriculture has generated awareness among farmers. Efforts have been taken to establish enterprise groups, expand the scope of existing SHG led enterprises and revive SHG led enterprises to enhance economic empowerment among women. The project interventions on enterprise development have contributed towards economic empowerment of communities.

On the H&S front, interventions were limited to that of promoting kitchen gardens. As part of the project, kitchen gardens were promoted among the paniya tribal community in Wayanad. The intervention aimed to address nutritional needs among tribal communities.

Under PoE, the infrastructural improvement of the local government school continues to aid students in their learning outcomes. Science labs and Smart classes were provided in some schools in the project villages. Schools which faced water shortage were provided with infrastructural support such as rainwater harvesting units (Capacity – 50,000 Lit). The interventions were focused on the category of schools known as “aided schools” in Kerala which are often left behind unlike government or private schools. In Wayanad, the tribal hamlet education program aimed to improve educational outcomes in the hamlets.

Overall the evaluation observed that there was convergence or utilization with the existing schemes of the government. This implies that the programs were designed to work in harmony with the ongoing government schemes and initiatives. MSSRF ensured the participation of local governing bodies and convergence with state government departments of agriculture, animal welfare, and National schemes like MGNREGA etc. in the interventions designed for communities. This convergence model is a key factor in ensuring the sustainability of the project interventions.

## 6. Recommendations

The study focuses on assessing the impact of the Holistic Rural Development Programme (HRDP) by HDFC Bank, executed through M S Swaminathan Research Foundation across 4 clusters in Kerala. It focuses on the program's process, milestones, impact, and challenges. Natural resource management (NRM), skill training and livelihood enhancement (ST&LE), health and sanitation (H&S), and education promotion (PoE) are the primary intervention areas. The assessment framework incorporates DAC criteria such as relevance, effectiveness, and sustainability. With a sample size of 425 beneficiaries, a comprehensive approach involving stakeholders and qualitative and quantitative data collection was used. The findings show that there are positive effects on income, water management, and energy. Skill development increased output and income, particularly for female entrepreneurs. Health services were limited to kitchen gardens, and educational interventions improved student engagement and attendance.

While several interventions have been undertaken under the HRDP Program in Kerala, covering more than 6000 beneficiaries, some interventions can still be elevated to the next level with minimal planning and investment. Designing interventions with impacts that last beyond the project duration is crucial. To further improve the outcomes of HRDP in Kerala, the following recommendations are made for the HDFC Bank's *Parivartan* and HRDP teams and the implementing partner, under each thematic area:

### 6.1 Natural Resource Management

Considering the ecological vulnerability and disaster proneness of the state, NRM interventions that prioritise climate and community are extremely crucial.

- Improved branding and visibility of vetiver system: As part of the project, vetiver system for natural fencing, environmental protection and to reduce landslides were promoted. 3000 vetiver saplings were planted in Kuyilumala, Idukki on government land which lacks visibility from the main road. Therefore setting it aside as a demo plot and conducting exposure visits may improve the sustainability of the initiative. In case of assets being allocated as public goods, instilling a sense of responsibility within the community is important.
- Ensuring management of rural assets: Field visits to monitor the conditions of rural assets and providing feedback on the maintenance of water harvesting units, dewatering systems and renovated ponds will ensure long-term sustainability of the interventions.
- Convergence with NREGA will be helpful in ensuring the sustainable management of community based rural assets.

### 6.2 Skill Training and Livelihood Enhancement

- Improving the quality of training programs: Lack of recollection of training programs among the beneficiaries was a major challenge. Considering that the impact evaluations are conducted after the project cycle and as different training programs are also conducted by various other agencies, ensuring that the training programs are unique is crucial. Focusing on interactive activity based

workshops, documenting feedbacks by sharing feedback forms etc. may capture the impacts of the training program in more detail. Instead of organising training programs in isolation, a series of training programs could be implemented to ensure continuity. Organizing trainings under plant clinics were quite successful and the farmers were able to recall the activities and services offered by the clinic in comparison to isolated trainings. A similar design could be followed for other training programs as well.

- **Livestock Management:** While livestock distribution provided immediate relief to several households, increase in the cost of livestock feed led to increased cost of production in several cases, making the activity less feasible to be continued after the project cycle. Therefore, linking the livestock feed crisis in Kuttanad cluster with feed based enterprises such as cattle feed mixing enterprise established in Ernakulam district offers potential for product diversification and supply of subsidized, balanced feed for improved livestock health.
- **Skill Enhancement for Value Addition:** Provide training on value addition and post-harvest processing techniques to enable farmers to process agricultural produce into marketable products. This can help to increase income and reduce post-harvest losses. The state has a favourable ecosystem for enterprise development under the Kudumbashree mission. Therefore, avoiding overlaps with mission's activities and designing unique programs to support enterprises will ensure greater visibility to the interventions.
- **Market Linkages and Entrepreneurship:** Facilitate market linkages for farmer interest groups to connect with buyers and processors especially in the case of *pokkali cum prawn cultivation*. Provide training on entrepreneurship and marketing skills to empower farmers to negotiate better prices and market their produce effectively.
- **Promoting local innovation:** Under the HRDP Project, support was provided to a local blacksmith to design a more efficient petty – para system for dewatering. However, ensuring that the system is made available to local farmers has been a major challenge.

### 6.3 Health and Sanitation

- **Focus on Women's Health:** Design specific health programs addressing women's health issues and needs. Provide access to reproductive health services, and maternal health care to improve the well-being of women in the communities.
- **Address unique health challenges in tribal communities:** The kitchen garden initiative aims to address nutritional challenges among paniya tribal communities'. However, sickle celled anaemia is common among tribal population in Wayand, the rough figures by the tribal department indicates 1,500 cases among tribals alone. Designing awareness programs, clinical screening followed by counselling, improving accessibility of medicines at subsidised cost, providing nutrient supplements etc. to prevent sickle celled anaemia may indicate better health outcomes.

### 6.4 Promotion of Education

- **Community Involvement in Education:** Involve parents and the local community in educational initiatives. Conduct regular meetings and workshops to create awareness about the importance of education and encourage community support for the schools.



- Ensure follow up of hamlet education program: Considering the severely disadvantaged tribal groups of Wayanad, hamlet education program seemed to generate interest in learning amongst the first generation learners who were part of the program. However, effective follow up activities and regular mentoring support is needed to improve the scale of impacts of hamlet education program.

## Annexures

### A Sampling Methodology

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

#### A.1 Quantitative Sample Size Calculation

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

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

Where,

N= sample size

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

Z<sub>1-α</sub>= standard score corresponding to the confidence interval, set at 95% (1.96 for two tailed test);

S<sub>e</sub>= margin of error, set at 5%;

D<sub>eff</sub>= factor for design effect, set at 1 (no design effect)

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

#### A.2 Quantitative Sampling Methodology

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

##### ***Stage 1 - Selection of beneficiaries:***

The list of beneficiaries from all the 3 districts acted as the sampling frame for the programme. This list was obtained from the implementing partner – M S Swaminathan Research Foundation. Simple random sampling was done to select the required number of households from within the list. Since beneficiary selection was undertaken independently for each programme, the selection of more than one beneficiary from a single household was probable.

##### ***Stage 2- Sampling for villages:***

Sampling for each village was done using the Probability Proportionate to Size (PPS) method. The percentage of the total number of beneficiaries in a district was taken out from the total beneficiaries. This percentage was then converted into a sample per district. A total of 3 districts were covered under the survey.

### A.3 Qualitative Sample Size Calculation

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

Since there was no baseline available for this evaluation, recall method was used in the household survey to assess the change that has happened over time. For this purpose, the respondents were asked to recall the value of critical indicators that they could recall from the time the programme started.

## B HRDI Methodology

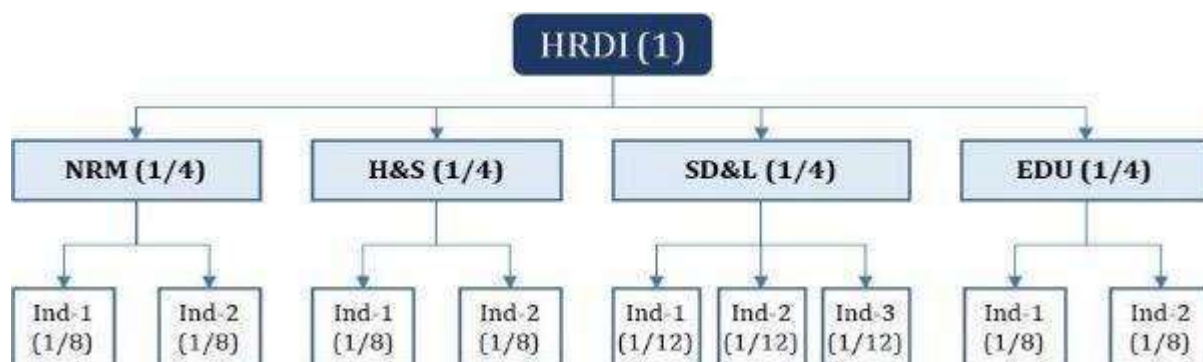
The outcome indicators included in the HRDI were obtained from different domains and are consequently measured on different scales. Therefore, to ensure the comparability of these indicators, all the indicators were converted into discrete variables such that the indicators could be measured between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

### B.1 Indicator Weights

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

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

Figure 38: Domain and Indicator Weights



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

Figure 39: Example of HRDI Calculation

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

	Percentage of households with access to improved toilet facility	$(1/4) \times (1/2) = 0.125$
<b>PoE</b>	Percentage of respondents reporting increased access to functional school physical infrastructure (drinking water posts, separate washrooms, furniture etc.)	$(1/4) \times (1/2) = 0.125$
	Percentage of respondents reporting increased access to functional learning infrastructure (library, science labs, smart class, etc.)	$(1/4) \times (1/2) = 0.125$

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 50<sup>th</sup> 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 50<sup>th</sup> percentile i.e., the median value of the income was taken. This median or 50<sup>th</sup> 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 Kerala has been detailed below

Domain	Indicators	Baseline	HRDI	End line	HRDI	% Change
NRM	Proportion of farmers with net income above median	0.17		0.21		
	Proportion of farmers reporting increased productivity of three main crops above median (before and after)	0.06	0.08	0.08	0.10	21%
	Percentage of farmers reporting access to irrigation	0.11		0.12		
H&S	Percentage of households reporting increase in use of fruits/vegetables from the nutrition garden	0.97		0.98		
	Percentage of households reporting increase availability of drinking water facility	0	0.24	0	0.25	1%
	Percentage of households with access to improved toilet facility	0		0		
Skill	Percentage of SHG members reporting income above median from rural enterprises	0		0		
	Percentage of households who are getting skill training & reporting increase in income from job/enterprise/self-employment	0.24	0.12	0.39	0.18	50%
	Percentage of HH reporting income above median from livestock	0.25		0.35		
Education	Percentage of respondents reporting increased access to functional school physical infrastructure (drinking water posts, separate washrooms, furniture etc.)	0.04		0.04		
	Percentage of respondents reporting increased access to functional learning infrastructure (library, science labs, smart class, etc.)	0.16	0.05	0.38	0.10	109%
	Total		0.50		0.63	27%

## C Overview of Impact Calculation

Impact of the programme was calculated based on the averages of quantitative output indicators as demonstrated below (see Table 13).

**Table 8: 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	95%		Medium
	NA1. (b) Proportion of farmers reporting increased input efficiency after the intervention	NA		
	NA1. (c) Proportion of farmers reporting increased income from	95%	56%	



	crops that were supported under HRDP.			
	N.A1.i(d) Average increase in income from crops that were supported under HRDP (% change)	27%		
	N.A1.I (e) Average increase in productivity from crops that were supported under HRDP (% change)	35%		
	N.A1.i(f) Average decrease in input cost (% change)	29%		
N.A2. Access to the farm management infrastructure	N.A2(a) Proportion of beneficiaries satisfied with the quality of available services (in farm management)	90%	60%	Medium
	NA2. (b) Proportion of farmers reporting project interventions in seeds, tools leading to an increase in production	71%		
	NA2. (c) Proportion of farmers reporting project interventions leading to increase in income (average of 3 crops)	16%		
	NA2. (e) Proportion of farmers currently practicing organic farming/conservation agriculture/other sustainable practices	NA		
	N.A2.(f) The proportion of farmers reporting an increase in the use of natural fertilizers?	61%		
<b>SA. Improved access to agricultural training and services</b>				
S.A.1 Access to Agriculture training and services	SA.i(a) Proportion of farmers who reported project training services are useful	21%	23%	Low
	SA.i(b) Proportion of farmers who demonstrate awareness regarding sustainable farming practices	24%		
S.A.2.Adoption of improved farming practices	SA.ii(a) Proportion of farmers who adopt scientific agricultural practices	21%	58%	Medium
	SA.ii(b) Proportion of beneficiaries reporting an increase in productivity due to better farm management	NA		
	SA.iii(c) Proportion of farmers reporting increased income	95%		

SB. Economic empowerment through collectivization (Only for SHG members)				
SB.2 Development of entrepreneurship	SB.ii(a) Proportion of SHG members who received training	15%	43%	Medium
	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	71%		
SC. Enhanced capacity for regular income generation				
SC.2 Access to self-employment and entrepreneurial opportunities	SC.2(a) Proportion of beneficiaries who established/ expanded entrepreneurial activities	41%	67%	Medium
	SC.2(b) Proportion of beneficiaries reporting improved capacity to undertake entrepreneurial activities	90%		
	SC.2(c) Proportion of beneficiary HHs reporting an increase in income	71%		
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%	49%	Medium
	SD.i(b) Proportion of beneficiaries reporting an increase in income from livestock management	48%		
	SD.i(c) Proportion of beneficiaries reporting improved livestock health	50%		
	SD.i(d) Proportionate increase in average income from livestock	89%		
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	27%	55%	Medium
	HC. i (b) No of HHs received seeds/training in the kitchen garden	128%		
	HC.i(c) No of HHs with improved vegetable/fruit consumption due to kitchen gardens	9%		
Outcome EA. Improved capacity of educational institutions to provide services				
	EA.i(a) Proportion of students/schools who report gaining	36%	36%	Low

EA.1 Access to improved physical infrastructure	access to functioning smart classrooms/science labs/libraries/learning aid/furniture			
EA.2 Improvements in quality of teaching	EA.ii(a) Proportion of teachers regularly utilizing smart classrooms	67%		
<b>Outcome EB. Improved learning outcomes</b>				
EB.1 Improved exam performance and subject confidence among students	EB.i(a) Proportion of students who gained access to coaching classes	NA	83%	High
	EB.i(b) Proportion of students who report improvements in access to reference material	75%		
	EB.i(c) Proportion of students reporting an increase in confidence in various subjects (lessons are easy to understand, more interesting, etc.)	81%		
	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 (attention span)	92%		

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:

$$z = (p_1 - p_2) / \sqrt{p(1-p)/(n_1 + n_2)}$$

where:

$p_1$  is the proportion in the first sample

$p_2$  is the proportion in the second sample

$p$  is the pooled proportion, calculated as  $(p_1n_1 + p_2n_2)/(n_1 + n_2)$

$n_1$  is the sample size of the first sample

$n_2$  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 ( $n_1p_1n_2p_2 > 10$ ) (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 ( $n_1p_1n_2p_2 > 10$ ).
- Binomial distribution: The population does not need to follow a binomial distribution, but the test is more powerful if it does.

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

**Table 9: Z-test Conducted for P0263**

Indicator	Proportion of farmers with income from agriculture above baseline median	Percentage of HH reporting income above median from livestock
p1 (proportion of first sample-endline)	63	69
n1 (sample size of p1)	98	367
p2 (proportion of second sample-baseline)	50	50
n2 (sample size of p2)	98	367
p	0.576530612	0.162125341
Calculation	0.070586908	0.02720802
z statistic	1.841701	6.983235
	Statistically NOT significant at 95% confidence level (or $p < 0.05$ )	Statistically significant at 95% confidence level (or $p < 0.05$ )
p-value for the z statistic	0.72	0.00001

## E Theme-wise Sustainability Matrix

The programme support provided demonstrated the capability to continue even after the programme ended. The programme's support to sustain improved outcomes are enumerated below (see Table 14).

**Table 10: Theme-wise Sustainability Matrix**

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

## F References

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