TITAN COMPANY

IMPACT ASSESSMENT REPORT

HOLISTIC ENVIRONMENTAL AND AGRICULTURE DEVELOPMENT (HEAD)

2024-25

IMPLEMENTED BY

National Agro Foundation

प्रगतेः मूलं प्रकृतिः

INDIAN INSTITUTE OF FOREST MANAGEMENT

Executive Summary

Titan partnered with the National Agro Foundation (NAF) to mobilise an Integrated Village Development Project, Holistic Environmental and Agriculture Development (HEAD), from 2022 to 2025 in two clusters: the Beemandapalli cluster in Krishnagiri District and the Thazhaiyuthu cluster in Tiruvannamalai District, Tamil Nadu. The dynamic NAF team, with their field offices, has demonstrated a well-structured and executed project with sustainable outcomes. The project activities can be categorised into five areas based on the activities and resources addressed: water resources development, soil and moisture conservation, agricultural development, capacity building and skill development, and livelihood promotion.

The Indian Institute of Forest Management, Bhopal, has been entrusted with the responsibility to assess the impact of the project activities carried out during 2024-2025 and the overall impact of the project. The impact assessment was carried out by the Institute's consultants. The impact assessment involved a field survey, a household survey, interaction with the key informers, the NAF field implementation team and other panchayat members of the project villages. During the IIFM team's field visit, both clusters and four villages were visited. The IIFM team used a data collection approach and tools such as a household beneficiary survey with a structured questionnaire (using KOBOTOOL), Focus Group Discussions with key questions and FGD procedures and Key informant interviews with the a Semi-structured interview schedule. For the evaluation of the Impact of the project, EASIER framework is used. Indicators for the framework have been arrived at through multi stakeholder consultation.

Water Resources Development has been the primary focus of the project, given the erratic rainfall and ever-depleting groundwater in the area. The DPR has considered the rainfall pattern, hydrogeology, and water demand of the area while siting various types of structures that store water on the surface and in sub-surface aquifers (aquifer recharge). These structures can store more than a lakh CUM of runoff water and provide irrigation and drinking water to the project villages and for cultivation. Due to the water resources development structures such as farm ponds, percolation tanks, check dams, and other aquifer recharge facilities, groundwater conditions improved, and the well water level increased by 15-20 ft. This has created water security and climate-resilient cultivation in the project villages.

The soil and moisture conservation and plantations have been undertaken to benefit the farmers directly. The field bunds have been made to improve the soil moisture, fertility, and also recharge groundwater. The farm bunds, with safe grassing out water from the field, helped increase the net and gross cultivated land among the project beneficiaries. Similarly, the loose rock check dams, a cost-effective structure with high impact, have reduced soil erosion and the entry of flash flood water into the field, and have helped combat topsoil erosion. Plantation made in the village commons and vetiver slip on the slopy land was found to be well-suited to the project landscape. The degraded village common has been restored with indigenous species, and this three-year-old plantation now provides improved shade, biodiversity, and ground grasses and herbs, which are important for local livestock. Overall, the WRD and S&MC interventions form the foundation of sustainable watershed management in project villages. Their integrated implementation enhanced groundwater and surface water resources, irrigation, soil health, conserved moisture, and strengthened agricultural resilience, making rural livelihoods more climate-adaptive and sustainable.

Activities related to the improvement of agricultural development tree resources were planned and implemented in both project clusters. Agricultural development includes organic inputs such as vermicomposting, Panchakavya, and intercropping seeds. Agroforestry and agrohorticulture were introduced in both the clusters. Each household planted an average 60 saplings. The species planted are native, and it is expected that the trees can yield substantially at 20, and horticulture can start yielding from the third year onwards. Based on the survival and growth factors, it can be concluded that this is one of the successful activities and models. The farmers have reported that the vermicompost and Panchakavya have been prepared using household materials and are benefiting them by reducing input costs and increasing resilience to pests and diseases. There are net savings and increased arable land by the farming beneficiaries. When combined, these plantation and agricultural development initiatives bolster food and livelihood security in rural communities, increase farm productivity and

incomes, and support ecologically sustainable farming. It is also true that by diversifying crops, intercropping with appropriate seed varieties increases soil fertility, reduces production risk, and improves land-use efficiency.

Capacity building and skill development has been major thrust areas of the project. More than 1,000 participants participated in various programs, including orientation programs, exposure visits, agri-technology programs such as field demonstrations and animal health camps, and skill development programs like beekeeping and solar traps, etc. The training and capacity, field demonstration, and health caps are highly relevant to local farming and livestock systems, as they are designed around existing resource availability and traditional practices. The orientation program is locally appropriate techniques related to crop planning, soil and moisture conservation, fodder management, and preventive animal healthcare. This relevance enhances participation, builds beneficiaries' confidence, and facilitates the quicker adoption of improved practices, thereby strengthening sustainable farming and livestock management in the project villages.

There have been quite well-designed livelihood promotion initiatives in the project villages, mobilised through women's SHGs. The revolving fund was made available to these SHGs to start the livelihood activities. The SHGs were guided and trained to maintain the accounts and other records. The SHGs decided to lend to SHG members to purchase milk cattle and goats, with 12% interest and repayment periods of 20 and 10 instalments, respectively. The dairy and goat rearing activities have flourished since then, and SHG members are earning and meeting their dietary needs. The women's economy is helping households pay for children's education and cover farming input costs. The fodder plots and azolla are helping reduce feeding costs and improve profit margins. The agency introduced a homeyard poultry concept and, for that, provided a cage and 20 chicks to the widow, single parent, and weaker section to earn their livelihood. Eggs are sold locally and earn a livelihood. The agency also organised several animal health camps to support the livestock activity in the villages. It has been seen that the beneficiary has procured more milk cattle after realising the economic benefit. It can be concluded that livestock support through fodder plots, along with women's empowerment, has made this initiative a successful activity.

All activities undertaken under the project align with the project's CSR objectives and targets for environmental sustainability, ecological balance, conservation of natural resources, rural development, promotion of sustainable livelihoods, nutrition, and food security. The activities have convergence with the State Government Watershed-based programs, the Climate Resilience Fund, horticulture and animal husbandry, and other programs at the state and national levels. As per the EASIER framework, the overall impact assessment score is 9.86 on a 10-point scale, which can be considered very good performance in terms of project planning, implementation strategy, and impact generated. The project outcome aligns with 13 of 17 UN Sustainable Development Goals.

The HEAD initiatives' long-term benefits extend beyond noticeable advancements in water conservation and agriculture. People take pride in and feel a sense of ownership because they have fostered a culture of independence and environmental responsibility. Without a doubt, TITAN and NAF worked together on the project, highlighting the project's positive outcomes and demonstrating their cooperation in bringing about meaningful, long-lasting change.

The NAF's efforts and the lively project teams' rapport with the residents are clearly visible in the project communities. The people sincerely thank Titan and the NAF for its timely and vital support in creating a knowledge foundation, a sustainable way of life, and resource and water security in the area.

Based on the performance, successful completion, and execution of the planned actions, the evaluator suggests initiating a withdrawal mechanism. It is essential for enabling communities and local groups to manage and preserve the benefits independently.

Acknowledgement

We extend our deepest gratitude to Shri Sridhar, Head of Sustainability, Titan Company Ltd., for entrusting the Indian Institute of Forest Management (IIFM), Bhopal, with the opportunity to undertake this impactful evaluation study. We also sincerely thank Ms. Ankita Hazarika from Titan Company Ltd. for her steadfast support and cooperation throughout the study period.

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List of Abbreviations

CSR – Corporate Social Responsibility
CUM – Cubit meter
DPR – Detailed Project Report
EASIER – Effectiveness, Awareness, Sustainability, Impact, Efficiency, Relevance
FCI – Food Corporation of India
FGD - Focus Group Discussions
HEAD - Holistic Environmental and Agriculture Development
IIFM – Indian Institute of Forest Management
IVDP - Integrated Village Development Program
KIIs - Key Informant Interviews
LFA – revolving Fund Assistance
LRCD – Loose rock check dam
MCD - Masonry check dam
NAF - National Agro Foundation
NGO – Non-Governmental Organization
PIA - project implementation agency
SHG – Self Help Group
SMC – Soil and Moisture Conservation
UGs – User Groups
UNSDG – United Nations Sustainable Development Goal
VDC – Village development committee
WRD - Water resources development

I INTRODUCTION

1.1 About National Agro Foundation, Tamil Nadu

The National Agro Foundation (NAF) is a well-known Non-Governmental Organisation (NGO) in India that promotes rural development and agricultural sustainability nationwide. NAF was created in 2000 with the goal of bolstering agriculture-based livelihoods while ensuring long-term food and environmental security by renowned statesman and former Union Minister Shri C. Subramaniam, recognised as the architect of India's Green Revolution. NAF works hard to advance sustainable farming methods, increase farm output, and improve the socioeconomic circumstances of rural people, especially in areas with limited resources and rainfall. To improve climate resilience and sustainable rural ecosystems, the Foundation has developed considerable competence in integrated watershed management, agricultural development, and livelihood enhancement projects. Its interventions centre on crop diversification, groundwater recharging, soil and water conservation, and the use of climate-smart farming techniques. NAF's emphasis on community involvement and capacity building is one of its main advantages. To empower farmers, women, and local institutions, the group regularly hosts exposure tours, demonstrations, and training sessions. By ensuring that local stakeholders actively participate in the planning, implementation, and sustainable management of agricultural practices and watershed infrastructure, these initiatives promote intervention ownership and long-term sustainability.

One of NAF's main projects is the Holistic Environmental and Agricultural Development (HEAD) Project, which aims to support sustainable livelihoods through agriculture and enhance resilient ecosystems. Through this initiative, NAF employs an integrated strategy that integrates livelihood support, enhanced farming methods, and natural resource management. The Beemandapalli cluster in Krishnagiri District and the Thazhaiyuthu cluster in Tiruvannamalai District, both in Tamil Nadu, are two revenue villages where the HEAD Project has been effectively implemented. Water availability has improved, agricultural output has grown, and farming communities are now more resilient to economic and climatic stressors thanks to these initiatives.

1.2 The HEAD Project

The three-year Detailed Project Report was developed by the NAF while considering the State's priorities and the priority landscape/area for watershed development in the present decade. The DPR was duly approved, and funding has been provided by the Titan for implementation during 2022-2025 in two clusters, viz. Thazhaiyuthu in Tirunnamalai and Beemandapalli in Krishnagiri Districts of Tamil Nadu. As per the DPR following are being the objectives of the project:

- Conservation of the environment, especially soil and water, leading to improved quality of life of resource-poor families.
- Sustainable Income generation by promotion of fodder plots, agro-horticulture, and agroforestry.
- Enhancing agricultural productivity and farm-based green livelihoods through organic farming and other agri-technology.
- Improving the socio-economic condition of women and other socially challenged sections to reduce poverty through SHGs

1.3 Objective of the present assessment study

To promote sustainable natural resource management, agricultural growth, and livelihood enhancement in specific rural areas, Titan collaborated with the National Agro Foundation (NAF) to implement the Holistic Environmental and Agricultural Growth (HEAD) Project. Titan hired the Indian Institute of Forest Management (IIFM), Bhopal, to conduct a thorough impact assessment of the HEAD Project, which was carried out in the Tamil Nadu districts of Krishnagiri and Tiruvannamalai between 2024 and 2025, as part of its dedication to accountability, learning, and evidence-based decision-making in CSR initiatives.

The impact assessment is intended to analyse accomplishments across environmental, agricultural, and livelihood-related components, systematically evaluate the project's implementation procedures and institutional mechanisms, and compare progress against predetermined goals. Examining how well the project interventions address the needs and objectives of the target communities especially in light of the local agroclimatic and socioeconomic conditions—is one of the assessment's main goals. The evaluation also aims to examine the overall effects of the HEAD Project,

including changes in the socioeconomic circumstances of the project villages, agricultural output, water availability, and environmental health. The study also examined the sustainability of project outcomes, including the longevity of natural resource management systems, the persistence of enhanced farming methods, and the ability of communities to preserve and expand the advantages over time.

This exercise's main goal is to assess how well the HEAD Project has benefited the communities it serves in a significant and long-lasting way. In addition, the evaluation seeks to highlight important lessons, pinpoint gaps and best practices, and offer practical suggestions to improve the planning and execution of upcoming CSR projects with related goals.

1.4 Scope of the present Impact Assessment

The scope of the present impact assessment covered the implementation of project period from April 2024 to March 2025. The assessment was undertaken to comprehensively evaluate the overall impact of the HEAD Projects implemented by the NAF with funding support from Titan during this period. The assessment focused on the effectiveness of project implementation, with particular emphasis on adherence to the planned implementation timeline (2024–2025), the efficient and transparent use of financial and physical resources, and the extent of local community participation and engagement in execution and maintenance. Community involvement was assessed as a critical factor influencing ownership, sustainability, and long-term success of the interventions. Further, the assessment evaluated the sustainability and long-term outcomes of the project interventions. This included analysing improvements in water availability through watershed and water-conservation structures, as well as changes in livelihood opportunities and overall socioeconomic conditions in the target villages. In addition, the assessment examined the environmental impacts of the HEAD Projects, with a specific focus on changes in watershed ecology. This involved assessing indicators such as groundwater recharge, soil moisture retention, vegetation cover, and overall ecological health resulting from the project interventions. Together, these dimensions provided a holistic understanding of the project's impact and its contribution to sustainable rural and environmental development.

1.5 Impact Assessment Study Approach

The evaluation has adopted a mixed-methods approach to examine the impact of the HEAD Project on environmental, agricultural, and livelihood-related components. Both qualitative and quantitative methods have been applied derived from secondary and primary data. Qualitative insights from project officials and beneficiaries are also used to contextualise the findings.

The evaluation is undertaken using the EASIER framework which focuses on assessing the scheme's Relevance, Effectiveness, Efficiency, Sustainability, Impact and Equity. Indicators for the framework have been arrived at through multistakeholder consultation. Overview of the evaluation approach is provided below.

Sampling: The methodology employed in this study is participatory, focusing on the identification of impact indicators derived from the programme data provided by the project implementation agency (NAF) and through interactions with beneficiaries. These indicators were organised into three main categories: socio-economic, economic, and environmental/ecological, each with its specific impact parameters measured in various units.

To assess these impacts, a questionnaire was developed and reviewed by the project implementation agency to incorporate their insights and additional programme data (annual data related to the components wise, village-wise beneficiaries). Based on this refined information (tabulation of the annual, village wise beneficiary data and past impact assessment sampled villages), the selection of sample villages and beneficiaries were finalised in collaboration with the project implementation agency (PIA). The villages selected for the study (table 2.1), those where numerous sub-components of the project such as natural resources conservation, livelihood and capacity development related which were implemented or is under implementation, allowing for a comparative analysis of the levels of impact.

Although the sample size remained within the target range of 5-10% of the total project scope, considerations were also made for the unique characteristics of the beneficiaries (those who have demonstrated the self-initiative to enhance the livelihood activities based on the skill and awareness from the agri-tech training and exposure visits) as well as the level of impact achieved. This approach enabled a deeper understanding of the nuances of project implementation and its outcomes.

In total, four villages across the two clusters were selected for detailed beneficiary-level data collection, ensuring a comprehensive evaluation of the project's impacts.

Data collection:
Primary Data collection was conducted through Household Survey, Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) in the villages. Kobotool was developed to conduct survey with the project beneficiaries in the month of November 2025.

Table 1.1: Data collection approach and tools

Method	Objective	Tools	Beneficiaries
Household Beneficiary Surveys	Identify perceived community participation, satisfaction, and benefits	Structured questionnaire	40 respondents (20 from each district) 33
Focus Group Discussions (FGDs)	Understand community priorities, participation, and sense of ownership	Key questions and FGD procedures	4 numbers and an average of 12-15 beneficiaries and panchayat members participated in each FGDs
Key Informant Interviews (KIIs)	Capture individual and institutional perspectives (UGs, Panchayat members, SHGs and Implementation agency.)	Semi-structured interview schedule	• 2 numbers, implementation agency with 4 field staff • 4 number, UGs and Panchayat members with 4-5 participants • 6 numbers, SHGs with 3-4 members

Data Analysis: Data collected with the help of schedules was entered into the computer using MS Excel sheets and tabulated to derive the inferences.

1.6 Project area

The project targets to benefit the rural communities of two clusters, namely, Thazhaiyuthu (villages: Porasapattu, Arattavadi and Thazhaiyuthu), Tiruvannamalai district and Beemandapalli (villages: Beemandapalli, Puliyanchery and Gollapalli), Krishnagiri district, with their integrated village development approach while addressing the ecological, environmental and livelihood aspects of the project villages. The project covers about 45% of the total population of the project villages.

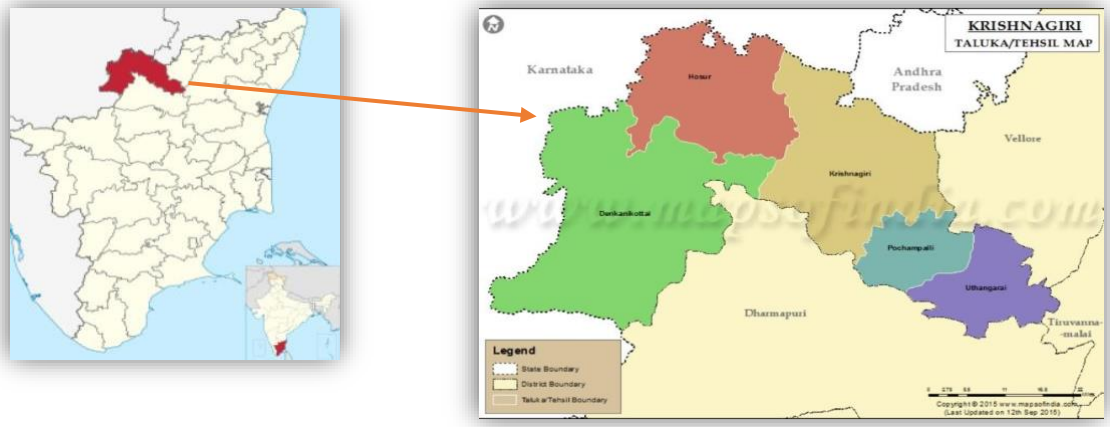
i. Beemandapalli cluster, Krishnagiri Dist. Villages: Gollapalli, Oddur, Beemandapalli, Puliyancheri, and Paraiyur.

The Krishnagiri district cluster comprises the villages of Gollapalli (Veppanapalli Block), Oddur and Beemandapalli (under Beemandapalli Village Panchayat, Veppanapalli Block), and Puliyancheri and Paraiyur located in the adjoining region. The cluster is characterised by upland plateau physiography marked by undulating plains interspersed with hill ranges. Agriculture in the area is predominantly rain-fed, and groundwater resources are critically stressed; the Veppanapalli Block is classified as overexploited, with groundwater development at approximately 120 per cent as per the Central Ground Water Board (CGWB).

Krishnagiri district had a total population of 1,546,700 as per the 2001 Census, with a predominantly rural population largely dependent on agriculture and allied activities for livelihoods. The physiography of the district is diverse, comprising structural hills in the southwestern part and denudational landforms such as buried pediments, inselbergs, and plateaus with conical hills aligned along geological lineaments. The average elevation of the plains is about 488

metres above mean sea level, while plateau regions rise to approximately 914 metres, with the highest peak reaching 1,395 metres at Guthrayan Durg. The Veppanapalli region reflects these hilly and undulating terrain characteristics.

Land use in the district is largely agricultural, with a net sown area of about 182,119 hectares. Forest cover accounts for approximately 202,409 hectares, while cultivable wasteland is limited to around 4,991 hectares. Major crops cultivated in the district include paddy (covering about 156,098 hectares), oilseeds, coconut, and sugarcane. Groundwater-based systems dominate irrigation infrastructure, particularly dug wells irrigating around 41,513 hectares, followed by tanks (10,112 hectares) and limited canal irrigation. The Veppanapalli Block has a notably high density of dug wells, contributing to groundwater stress.



Groundwater in the region occurs in weathered and fractured crystalline formations, primarily comprising gneiss and granite. Pre-monsoon groundwater levels range from 0.5 to 9.9 metres below ground level (bgl), and dug wells yield between 100 and 500 litres per minute. The Veppanapalli firka (sub-division), covering an area of approximately 104 square kilometres, shows an extremely high groundwater development stage of about 254 percent, compounded by low monsoonal rainfall averaging 678 mm. Groundwater quality issues, such as salinity, alkalinity, and localised occurrences of excess iron, fluoride, and nitrate, have also been reported.

Demographically, the district recorded 795,718 males and 750,982 females, with an overall literacy rate of approximately 72 per cent. The project villages, including Gollapalli and Oddur, are small rural hamlets located within predominantly agrarian blocks. While urban areas in the district receive varying levels of water supply ranging from 50 to 90 litres per capita per day (lpcd), rural areas continue to face water supply deficits, which are addressed through governmentsupported rural drinking water schemes.

The villages in the cluster are revenue villages and village panchayats, with Tamil as the primary language, alongside Telugu and Kannada due to the district's proximity to Andhra Pradesh. The landscape lies along the border of Andhra Pradesh, within an agricultural setting adjoining the Melagiri hill ranges, which retain moderate forest cover. The cluster is located approximately 16– 18 kilometres from Krishnagiri town.

In terms of water resources and land use, the area depends largely on seasonal rivers and streams, including the Cheyyar River near Paraiyur. Loamy soils and the predominance of rain-fed agriculture present significant challenges to agricultural productivity. Given its ecological sensitivity and water stress, the district is prioritised under state-level watershed management programmes aimed at soil and water conservation. Land use in the region reflects a mix of agricultural and forested landscapes.

As per the Detailed Project Report (DPR), the Krishnagiri cluster comprises 964 households and a population of 3,718. Specifically, Beemandapalli village has 387 households and a population of 1,514, while Puliyancheri village has 300 households and a population of 1,056.

ii. Thazhaiyuthu cluster, Tiruvannamalai Dist, Tamil Nadu Villages: Arattavadi, Thazhaiyuthu, Porasapattu

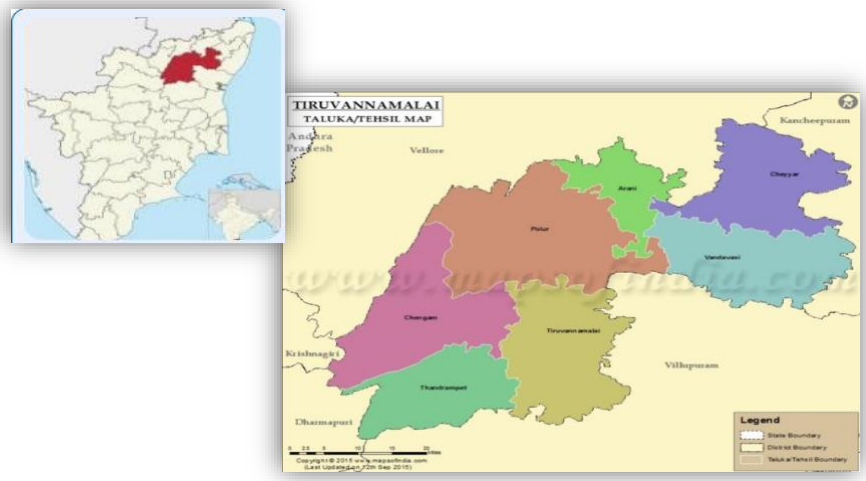
The project cluster villages are located in Chengam Block of Tiruvannamalai District, approximately 37 kilometres west of Tiruvannamalai town, which serves as the district headquarters. Among the cluster villages, Arattavadi functions as an independent Village Panchayat, while nearby villages such as Thazhaiyuthu and Porasapattu are

administratively linked and show close proximity in census records (Census, 2011). The region is predominantly rural, with livelihoods largely dependent on agriculture and allied activities.

The cluster's landscape is characterised by hard rock terrain and undulating topography, strongly influenced by the foothills of the nearby Javadi hill ranges. Agriculture in the area is dominated by dryland farming systems, with a heavy reliance on monsoonal rainfall. Groundwater resources in the region are under significant stress due to prolonged overexploitation and erratic monsoon patterns. As per TWAD, 2023, the groundwater development stage in Chengam firka (taluk/subdivision) ranges from 107 to 148 per cent, indicating semi-critical to overexploited conditions.

Geologically, the area is underlain by Archaean crystalline hard rock formations, primarily consisting of gneiss and charnockite. These formations limit groundwater storage to weathered and fractured zones, resulting in highly variable well yields. The terrain is gently undulating with localized hilly features, influencing surface runoff and soil erosion patterns.

The Thazhaiyuthu cluster covers a total geographical area of approximately 2,156 hectares. Of this, nearly 59 percent comprises dryland used for rain-fed cultivation of crops such as sorghum, millets, and pulses, while about 6.57 percent constitutes wetland areas supporting paddy cultivation through limited perennial water sources. To manage runoff, reduce soil erosion, and enhance groundwater recharge, various soil and water conservation structures—including field bunds, percolation structures, and check dams—are commonly observed across the cluster.



The predominant soil types in the region are red loam and red series sandy soils, which are typical ferruginous loamy soils prevalent across Chengam Taluk. Variants such as thin red soils, deep red soils, clayey soils, and gravelly soils are found across different parts of the district, while black loam soils are restricted to riverbeds and low-lying areas. These soil characteristics are moderately suitable for dryland agriculture but require moisture conservation measures for sustainable productivity.

Groundwater occurs mainly within the weathered and jointed zones of hard rock aquifers, typically at depths of 18 to 32 metres. Pre-monsoon groundwater levels generally range from 0 to 15 metres below ground level (bgl), and post-monsoon recharge often raises water levels to near ground level in favourable locations. However, due to overextraction, many wells—particularly those deeper than 12 metres—tend to dry up during the summer months. Groundwater conditions are monitored through a network of approximately 285 observation wells, including piezometers, across Chengam Taluk. Recharge interventions such as percolation ponds and recharge structures play a crucial role in sustaining groundwater availability.

Irrigation in the cluster is supported by a mix of traditional and modern sources, including tanks, dug wells, and borewells. These sources, however, remain constrained by low and variable rainfall, with Chengam receiving an average monsoonal rainfall of approximately 882 mm (CGWB, 2018). As a result, agriculture in the region faces recurring water stress, underscoring the importance of watershed-based interventions.

As per the Detailed Project Report (DPR), the cluster comprises 1,792 households and a combined population of 7,254. Village-wise details indicate that Porasapattu has 591 households and a population of 2,532; Arattavadi has 551

households and a population of 2,302; Thazhaiyuthu has 650 households and a population of 2,420; and Gollapalli has 277 households and a population of 1,148. These villages together form the project's core intervention area, characterised by dryland agriculture, groundwater stress, and a strong need for integrated watershed and livelihood development interventions.

II Findings of the impact assessment

2.1 Introduction

Between 2021–2022 and 2024–2025, the project interventions were planned and carried out in two clusters: Beemandapalli in Krishnagiri District and Thazhaiyuthu in Tiruvannamalai District, both in Tamil Nadu. In certain blocks of these two districts, the Holistic Environmental and Agriculture Development (HEAD) Project is a strategic project that aims to improve natural resource management and encourage sustainable rural development. The initiative directly serves over 10,972 people from 2,756 families across 3,760.34 hectares in the Beemandapalli and Thazhaiyuthu clusters. The HEAD Project addresses key issues such as water scarcity, land degradation, and livelihood vulnerability through an integrated, participatory approach. The project's main goals include protecting and improving natural resources, encouraging climate resilient sustainable farming methods, increasing green cover through plantations and agroforestry, and bolstering livelihood opportunities both on and off farms. Together, these interventions aim to strengthen agricultural productivity, promote ecological balance, and increase the long-term resilience of rural communities in the project regions.

The following table provides a brief description of the respondents. From the table it can be seen three villages in each cluster were interacted. About 40 beneficiaries from the sampled villages (20 from each district) were interacted with during the field visit by the consultant and researcher. In the Krishnagiri district, about 61% of the respondents are from Beemandpalli village where the maximum activities done under the project. In Krishnagiri district, about 46% of respondents are female, and 51% are in the age group of 50 years or more. Only in Gollapalli village about half of the participants were in the age group of less than 30 years with minimum age of 26 years. In the district primary occupation of the respondents is mostly agriculture and secondary occupation is concerned they were mostly labours. A few respondents' secondary occupation is business and village services. In the case of Tiruvannamalai district, 42% respondents are female and 53% in the age group of 40-50 years age group. Agriculture is the primary occupation, and labour is the secondary occupation in the district. A few respondents reported that business and service as their secondary occupation.

Table 2.1: Demographic and socio-economic profile of the beneficiary respondents (N = 40) (values in percentage)

District	Village Name	Respondents (%)	Sex		Age group (%)				Marital status			Occupation	
			Female	Male	<30	30-40	40-50	>50	Married	Widow	Unmarried	Primary	Secondary
Krishnagiri	Bhimandapalli	61.54 (12 no.)	87	13	0	13	50	37	100	0	0	Agriculture (100%)	Business (13%), labour (87%)
	Puliyacheri	23.08 (5 no.)	0	100	0	0	33	67	67	33	0	Agriculture e (100%)	Others (65%), Labour (35%)
	Gollapalli/ Oddur	15.38 (3)	50	50	50	0	0	50	0	50	50	Agriculture e (100%)	Labour (50%), Business (50%)
	Total	100	46	54	17	4	28	51	56	28	17		

Tiruvannamalai	Arattavadi	33 (7 no.)	0	100	0	33	33	34	100	0	0	Agriculture (100%)	Labour (65%), Business (35%)
	Porasapattu	22 (4 no.)	100	0	0	0	100	0	100	0	0	Agri(50%), Service (50%)	Labour (50%), Business (50%)
	Thazhaiyuthu	45 (9 no.)	25	75	0	0	25	75	100	0	0	Agriculture (100%)	Labour (100%)
	Total	100	42	58	0	11	52.7	36.3	100	0	0		

Regarding respondents' participation in the program, the following table shows that all respondents are program beneficiaries. Many of them are beneficiaries of more than one activity. A total of 50 and 17 per cent of respondents in Krishnagiri and Tiruvannamalai district Cluster have participated in the WRD activities; similarly, 88% and 92% are in the agriculture development activities, 53% and 44% in livestock-related activities, 49% and 25% are SHG members, 100% have participated in training and capacity building, 61% and 100% in plantation activities, and 44% and 36% in soil and moisture conservation activities.

Table 2.2: Respondents' participation in the project activities (%)

District	Village Name	Beneficiary	Participated in						
			Water resource development	Agri horticulture	Cattle livestock	SHGs	Training	Plantation	Soil & moisture conservation
Krishnagiri	Bhimandapalli	100	0	63	75	63	100	50	38
	Puliyacheri	100	100	100	33	33	100	33	50
	Gollapalli/Oddur	100	50	100	50	50	100	100	33
	Average	100	50	88	53	49	100	61	40
Tiruvannamalai	Arattavadi	100	50	100	33	0	100	100	50
	Porasapattu	100	0	100	100	50	100	100	25
	Thazhaiyuthu	100	0	75	0	25	100	100	33
	Average	100	17	92	44	25	100	100	36

The project has been a structural development process so as to ensure sustainable resource development and measurable long-term impacts. The village institutions have extended all kinds of support and expressed their sense of ownership of the village assets created. Further, to maximize the return in the long run, it is important for the grassroots institutions like user groups and panchayats to invest in the maintenance and expansion of livelihood activities through the convergence of the government schemes and programs.

The NAF has carried baseline surveys and institutionalized the project activities through community institutions such as user organization UG), self-help groups (SHG) and village development committees VDC), etc. to ensure the

sustainability, community ownership, and measurable long-term impacts of various village infrastructures, community skill and capacity.

The organization also taken care of continuity planning to maximize returns on investment and strengthen resilience in the project villages. Though the Detailed Project Report served as the basis for planning and implementation, the continued efforts and initiatives have been the major approach to generate meaningful outcome.

2.2 Project activities

The present impact assessment has been carried out for the activities conducted during 2024-2025 by the NAF in the two clusters. These activities are categorised into:

A. Water resources development, which includes Farm Pond; Village Pond creation and rejuvenation of existing ponds; Nala channel clearance; Percolation Pond/ tank; Masonry check dam (MCD), including repair of existing MCD; Sunken pits; well (dug well and bore wells), recharge pits.
B. Soil and Moisture conservation interventions include field bunds with pipe outlet; loose rock check dam (gully plugging); vetiver slips/fodder plot; tree plantation.
C. Plantation and Agriculture development that includes Agro-Horticulture & Agro-Forestry; Fodder plots; Home Garden; Vegetable pandal; Organic farming inputs
D. Training, Exposure visits, skill development and Demonstration: Orientation training; Agritech training; Field demonstration; Exposure visits; Animal health camp; etc.
E. Livelihood supports include the provision of revolving funds for SHGs, Dairy development, goatery, and backyard poultry.

2.2.1 Water resources development (WRD)

The local community considers water resource development to be the most valued activity in the area, given the groundwater conditions and erratic rainfall. The structures and design follow the ridge to valley principles. In the transition zones of the watershed, percolation tanks, channel clearance, and gully plugging structures are constructed, and in the discharge zones of the watershed, structures like farm ponds, recharge shafts, etc. are constructed to recharge groundwater, and also to create surface water bodies. Further these structures are constructed, renovated in the village common land as well as in the private land holdings. The structures created has direct bearing on the water resources of the villages. Following are the details of the interventions under the head water resources development.

a. Farm pond and pond inlets

Farm ponds constitute one of the most critical rainwater-harvesting and water-conservation infrastructure projects created under the HEAD Project in the groundwater-overexploited, water stressed dry regions of Tamil Nadu. These structures were constructed based on farmers' interest and willingness to allocate a portion of their agricultural land, ensuring both ownership and effective utilisation. Farm ponds serve as decentralised surface-water storage systems that capture and store monsoon runoff, thereby enhancing water availability during dry spells and reducing reliance on groundwater.

As per information provided by the National Agro Foundation (NAF), no new farm ponds were constructed in the project villages during the evaluation year 2024–2025, as the physical targets for this intervention had already been achieved during the earlier implementation phase (2022– 2024). Although the structures were created in previous financial years, their tangible impacts were realised during the current assessment period due to favourable rainfall patterns and improved access to stored water from the existing infrastructure.

According to project records, a total of 65 farm ponds were constructed across the two project clusters—14 ponds in the Beemandapalli cluster and the remaining 51 pounds in the Thazhaiyuthu cluster. The total water storage capacity created through these ponds is estimated at approximately 5,963.94 cubic metres in the Beemandapalli cluster and 17,652.63 cubic meters in the Thazhaiyuthu cluster. The farm ponds typically have catchment areas ranging from 20 to 50 hectares and command areas of about 2 to 4 hectares, enabling supplemental irrigation for adjacent agricultural fields.

The availability of stored surface water through farm ponds has provided farmers with multiple livelihood opportunities. In addition to enhancing irrigation for crops and fodder plots, several beneficiaries have utilised the ponds for allied activities such as fish farming and dairy development. These diversified livelihood options have contributed to increased farm incomes and improved household resilience during periods of water scarcity.

In terms of gender equity, women's direct ownership of farm pond assets remained limited (less than 10 percent), primarily due to land titles being held in the names of male family members. Nevertheless, the benefits of the infrastructure extend to the entire household, with women playing a significant role in water use for agriculture, livestock rearing, and income-generating activities such as fisheries. Consequently, the farm ponds indirectly contribute to women's economic participation and household-level decision-making.

An important complementary intervention under the project is the construction of farm pond inlets. Given that the catchment areas of most farm ponds are cultivated lands, surface runoff often carries silt and nutrient loads into the ponds, leading to sedimentation and reduced storage capacity. To address this issue, farm pond inlets were constructed as silt-trapping and flow-regulating structures. These inlets facilitate the entry of relatively silt-free water into the ponds, thereby improving water quality and prolonging the functional life of the ponds. Improved water quality also supports fish cultivation and other productive uses.

In both clusters, farm pond inlets were constructed with standard dimensions of approximately 5 feet × 5 feet, using sand aggregates, hollow bricks, and PVC pipes. The average cost of constructing each inlet was about ₹6,500. These low-cost yet effective structures have played a crucial role in improving the efficiency and sustainability of farm ponds. Details of farm ponds constructed during earlier implementation years are presented in the corresponding tables.

Findings from key informant interviews indicate that the farm ponds and associated inlet structures have positively influenced cropping patterns and farm productivity. Beneficiary farmers reported an average increase in income ranging from ₹15,000 to ₹18,000 per acre, attributed to assured supplemental irrigation from pond water and improved recharge of nearby wells and borewells. The integration of surface water storage with groundwater recharge has enabled farmers to become more self-reliant in meeting their irrigation requirements. Similarly, the fishery has provided them an additional income of Rs. 60000 to Rs. 85000 per pond per year.

Overall, the creation of farm ponds and pond inlets has had a direct and measurable impact on the local hydrological regime by creating new surface water bodies and improving groundwater levels in nearby wells and borewells. These interventions have significantly enhanced water security, agricultural productivity, and livelihood sustainability in the project villages, demonstrating their effectiveness as climate-resilient water management solutions in dry and groundwater-stressed regions.

One of the participants, Mr Beni Varadaraju, Beemandpalli, mentioned that he recharges the pond with river water once every 5 days for fish rearing and harvests 2 crops in a year. Each harvest is of 500 kgs and is sold for Rs. 80/kg. He is purchasing fish fingerlings and feeding them at an average cost of Rs. 6000 per crop. He will continue this activity in the future because of the high return on the investment.

Table 2.3: Farm pond, Beemandpalli, Krishnagiri District

FY	Villages covered	Number of ponds/ beneficiaries	Average size (CuMtr)	Gender %	Potential created (Water storage) (in CUM)	Av. Cost (Rs)
2022-2023	Beemandapalli	1	316	0	316.4	37968
2023-2024	Oddur, Gollapalli, Puliyacheri, Beemandapalli	13	434	0	5647.543	52131.17
Total	All villages of the cluster	14	375		5963.943	51119.51

Table 2.3a: Farm Pond Thazhaiyuthu, Tiruvannamalai Dist.

FY	Villages covered	Number of ponds/ beneficiaries	Gender (Women)%	Average size (CuMtr)	Potential created (Water storage) (in CUM)	Av.Cost (Rs)
2023-24	Thazhaiyuthu, Arattavadi, Porasapattu	51	8	15*10*2 meter	17652.63	41535.6
Total	All villages of the cluster	51	8		17652.63	2118315.6

From the above table it can be seen that 8% of the beneficiary respondents were women, this is because the land title is in the name of head (father) of the family.

b. Village pond renovation

Restoration of the village pond is crucial to increase water storage potential and groundwater recharge. The siltation and waterweeds reduce the potential of the ponds, which require restoration. Similarly, repairing bunds and water outlets is equally important. Under the project, during the last two years in the Thazhaiyuthu cluster, 13 ponds were repaired and restored (one pond was repaired in Porasapattu during 2024–2025), and 63746 CUM of water storage potential has been created. These ponds are strategically located, and villagers have reported a dependence on them for cultivation and livestock. Machinery was used, and labor (local) was engaged to repair and restore the ponds. The pond restored during 2023-2024 has reported positive impacts in terms of irrigation, groundwater recharge, and livestock use. According to the beneficiaries, the intervention is cost-effective and has provided them with significant relief from water scarcity and ever-depleting water levels in their wells. Beneficiaries expected that these works would be further taken up by the Panchayat to improve the village's water resources. The following table provides details on the intervention. During the visit to Porasapattu, the beneficiaries reported that the intervention has increased the total capacity of the pond by 36800 CuM, which is of great benefit to the command area farmers.

Table 2.4: Renovation of village ponds in Thazhaiyuthu cluster, Tiruvannamalai Dist.

FY	Villages	Nos	Potential created (Water storage) (in CUM)	Cost (Rs)
2023-2024	Arattavadi, Porasapattu, Thazhaiyuthu	12	43552.68	5226322
2024-2025	Porasapattu	1	20195.44	2423453
Total		13	63748.12	7649774

c. Groundwater well and bore well recharge pits

The literature review, baseline studies, and the Detailed Project Reports (DPRs) clearly indicate that groundwater resources in the project area are critically overexploited. Water availability in wells during the lean (non-monsoon) period was found to be negligible, severely constraining agricultural activities. As a result, farmers were largely unable to cultivate their lands beyond the monsoon season, leading to reduced cropping intensity and increased livelihood vulnerability. The situation is further aggravated by consistently below-normal rainfall in the region, which has limited crop cultivation across large parts of the project villages.

While large-scale recharge structures such as percolation ponds are effective, their implementation requires substantial financial investment and the availability of suitable land—both of which are limited in the project villages. Recognising these constraints, the implementing agency adopted a context-specific, cost-effective approach by focusing on decentralised groundwater recharge interventions. Based on a detailed assessment of groundwater fluctuations, aquifer characteristics, and existing well infrastructure, suitable wells and borewells were identified for recharge using non-committed runoff available within micro-watersheds and village boundaries.

Under this approach, borewell and open well recharge pits were constructed to augment groundwater aquifers directly. As reflected in the project records, the Beemandapalli cluster created a total of 8 borewell recharge pits during 2023–2024—one on common land and 7 on private agricultural holdings. The average cost per structure was approximately ₹32,500. In the Thazhaiyuthu cluster, 18 well recharge pits were constructed during 2024–2025 at a comparatively lower average cost of ₹20,980 per structure. Collectively, these interventions have created an estimated additional groundwater recharge potential of about 3,015.6 cubic meters in Beemandapalli and 6,804 cubic meters in Thazhaiyuthu.

In terms of social inclusion, women's ownership and participation varied across the clusters. In Beemandapalli, women's share of asset ownership was nil, primarily because land and well ownership were vested in male household members. In contrast, the Thazhaiyuthu cluster demonstrated better inclusion, with women accounting for approximately 22 per cent of beneficiaries. Detailed information on the location, cost, and capacity of these recharge structures is presented in the corresponding tables.

The impacts of these recharge pits are significant when viewed in relation to their cost-effectiveness and long-term benefits. These structures facilitate direct recharge of aquifers, minimizing conveyance losses and ensuring efficient utilisation of runoff. Since the surface area of the recharge pits is small and water stagnation is limited to one to two days, evaporation losses are negligible. Key informant interviews revealed that beneficiary borewells have experienced increases in yield of 12 to 18 per cent, along with an extension of water availability by 2 to 3 months compared to pre-project conditions.

Importantly, the benefits of these structures are expected to be sustained over the long term. The recharge pits are designed with graded filter media that prevent silt from entering and clogging the aquifer, thereby maintaining recharge efficiency. While these structures require periodic maintenance—primarily involving the replacement or cleaning of filter media—the overall maintenance requirements are minimal and manageable by the beneficiaries.

Similar to other watershed interventions such as percolation ponds, sunken pits, stream channel clearance, and farm ponds, borewell and well recharge pits improve groundwater levels, enhance aquifer yields, and expand irrigation potential within the well command areas. According to beneficiary feedback, irrigation potential in these command areas has increased by approximately 18-22 per cent following the implementation of recharge structures. Additionally, borewell recharge pits are known to improve groundwater quality by diluting contaminant concentrations, and similar improvements have been reported in the project area. The following tables provides details on the interventions by the agency.

Overall, the adoption of well and borewell recharge pits represents an appropriate, scalable, and economically viable solution for groundwater augmentation in land- and water-constrained dry regions. These interventions have played a crucial role in improving water security, stabilising agricultural production, and enhancing the resilience of farming communities in groundwater overexploited areas of Tamil Nadu.

Table 2.5: Creation of borewell pits in Beemandapalli, Krishnagiri District

FY	Villages covered	Pits on common land	Pits on private land	Av Dimension	Potential created (Water storage) (in CUM)	Av. cost (Rs)
2023- 24	Puliyancheri, Beemandapalli, Gollapalli	1	7	5 m * 5 m	3015.6	32500

Table 2.5a: Well recharge pits, Thazhaiyuthu, Tiruvannamalai Dist.

FY	Villages covered	Pits on private land	Total beneficiaries	Gender%	Av Dimension	Potential created (Water storage) (in CUM)	Av. cost (Rs)
2024-25	Thazhaiyuthu, Arattavadi	18	18	22	5 m * 5 m	6804	20980

d. Percolation pond/ tank

Percolation ponds are small- to medium-sized ponds constructed strategically where the topography is low-lying, the surface aquifer is permeable and porous, and the underlying aquifers have the potential to store and yield water to wells and borewells to capture runoff rainwater. Runoff water is harvested in the structure, and all biological interactions within it are restricted to prevent groundwater pollution. These are the most potential structures built across India, wherever groundwater depletion is reported. It is the most relevant structure in the area due to erratic rainfall, hard rock geology (weathered and fractured subsurface formations), overexploited aquifers, and seasonal drying of open wells and borewells. In the study area, it is constructed within drainage lines or natural depressions within micro-watersheds. They are a cost-effective and sustainable intervention for addressing groundwater depletion in the project areas. They are planned scientifically and maintained through community participation, and they play a crucial role in strengthening local water security, improving agricultural resilience, and supporting climateadaptive rural livelihoods.

During the assessment period, two tanks were constructed in the Thazhaiythu cluster, Tiruvannamalai.

For the impact assessment, the percolation tank constructed in the Bemandpalli cluster was visited and interacted with to understand its effectiveness and benefits. The farmers in the villages reported that the pond has raised the groundwater level by 5-7 meters, and they now have water throughout the year. It has helped them bring more cultivated land under second and third paddy crops and more salinity-affected land under grass/fodder cultivation, thereby enhancing their dairy activity. They also reported that due to increased soil moisture in the surrounding areas, coconut production has increased. The percolation pond in Puliyancheri village was visited, and the user group members interacted. The user group, comprising 200 households, reported that the pond is very beneficial to them for livestock rearing, maintaining water levels in the wells (which number in the 100s), and irrigating the entire village's cultivated land. They also reported that, due to the impact, the water level in the well has increased by 20 ft and is now available for almost 10 months, up from 4 months before the project intervention. They also reported that, due to increased irrigation water, the cropping pattern has changed; they are now growing paddy and sugarcane. He also reported that his coconut farm, which adjoins the pond, is now yielding about 250 coconuts per tree per year, up from 100 earlier. (As reported by Mr. Shanta Murthy). The following tables provide details on the interventions in both clusters.

Table 2.6: Percolation pond construction in Beemandpalli, Krishnagiri District

FY	Villages covered	Number of tanks	Av dimensions	Water stored (Qty in CUM)	Av. Cost Rs
2022-2023	Gollapalli	1	50 m * 50 m * 1.5m	1161.932	139431.8
2023-2024	Puliyancheri, Beemandapalli	3	50 m * 50 m * 1.5 m	21195.16	2543419

Total		4			2682851

Table 2.6a: Percolation Pond construction in Thazhaiyuthu, Tiruvannamalai District

FY	Villages covered	Number of tanks	Av dimensions	Water stored (Qty in CUM)	Av. Cost Rs
2024-2025	Porasapattu, Arattavadi	2	50 m * 50 m * 1.5 m	16213.47	972808.2

e. Channel clearance

Local nala/streams are crucial for command area farmers to harvest rainwater and combat flash floods. Most of the nala in the project villages were silted and invaded by invasive species. Under the project channel clearance work was undertaken with the objectives of rejuvenating streams and improving the bank infiltration and soil moisture conditions in the area. The agency conducted a systematic survey, and demarcated stream stretches were cleared using machinery and labour. The average dimension of the clearance cleared was 800 m in length, 3.5 m wide, and 0.6 m deep. During the assessment period, the agency conducted 3 stretches in Gollapalli (Beemandpalli cluster) and 11 sections in Thazhaiyuthu, Arattavadi, and Porasapattu (Thazhaiyuthu cluster). For the purpose of impact assessment, Beemandpalli and Porasapattu were visited. It has been observed that the intervention has improved nala conditions and created additional water storage capacity in the nala, helping to improve bank infiltration and groundwater recharge. The nearby farmer informed us that the initiative is cost-effective and that he has benefited from the prevention of floodwater from entering his well and the increased water level in his well. Details on the intervention are documented in the following tables.

Table 2.7: Nala Channel clearance in Beemandapalli cluster, Krishnagiri Dist.

FY	Villages covered	Number of SF No.	Number of Stretches	Av. Dimensions	Water storage capacity created (Qty in CUM)	Cost (Rs)
2022-2023	Beemandapalli, Gollapalli	3	3	800m* 3.5m* 0.6 m	4084.61	367614.9
2023-2024	Beemandapalli, Gollapalli, Puliyancheri	10	5	800m* 3.5m* 0.6 m	5979.57	538161.3
2024-2025	Oddur, Gollapalli	3	3	800m* 3.5m* 0.6 m	1184.11	106569.9
Total		16	11		11248.29	1012346

Table 2.8: Nala Channel clearance in Thazhaiyuthu cluster, Tiruvannamalai District.

FY	Villages covered	Number of SF Nos	number of sections	Av. Dimensions	Water storage capacity created (Qty in CUM)	Cost (Rs)
2023-2024	Thazhaiyuthu, Arattavadi, Porasapattu	25	21	800m* 3.5m* 0.6 m	24872.12	2238491
2024-2025	Thazhaiyuthu, Arattavadi, Porasapattu	17	11	800m* 3.5m* 0.6 m	8374.07	753666.3

Total		42	32		33246.19	2992157

f. Masonry check dam (MCD) and repair of MCD

Runoff harvesting structures were constructed, and a few earlier structures from state watershed projects were repaired. Both initiatives are crucial for addressing runoff in the nalas, providing irrigation for crops and livestock, and supporting wildlife, which is regularly sighted near structures in the forest area. Gravitational irrigation from these structures (backwater and structures) is practised. MCDs are constructed in the watershed's transition zones, where sufficient water storage space/land is available. During the assessment period, two structures in the Thazhaiyuthu cluster were constructed. They are of the opinion that the intervention is very useful because it provides water to meet their irrigation demand for almost 4 months and also for livestock. Because the upper landscapes of the villages are deprived of groundwater availability and also surface irrigation possibilities. The earlier structures were broken, were not storing any water, and failed to address bank erosion, flash floods, and crop loss during torrential rain. A beneficiary also reported that he earned construction wages during the lean period. The following tables provide details on the intervention.

Table 2.9: MCD construction in Thazhaiyuthu cluster, Tiruvannamalai dist.

FY	Villages covered	Number of structures	Qty (dam length) (mtr)	Dimension (Av)	Cost
2023-2024	Arattavadi, Porasapattu, Thazhaiyuthu	8	48	8m, 4m 10 CD constructed	3120000
2024-2025	Arattavadi, Porasapattu	2	16		780000
Total		10	64		3900000

Table 2.9a: MCD renovation/ repair in Thazhaiyuthu cluster, Tiruvannamalai dist.

FY	Villages covered	Number of structures	Qty (mtr)	Cost (Rs)
2023-2024	Arattavadi, Porasapattu, Thazhaiyuthu	5	30.35	365000

g. Sunken pits

Various kinds of water harvesting structures have been constructed in the ever moisture-stressed and groundwater-depleting project villages. Sunken pits are unique structures used to harvest rainwater, improve soil moisture, and recharge groundwater (aquifers), widely found in the semiarid and arid regions of Tamil Nadu. Under the project, during the assessment period, 17 sunken pits were constructed in the Thazhaiyuthu cluster, increasing water storage capacity and runoff conservation to 5445.6 CuM. An average-sized pit measuring 2.5 m × 1 m was dug in the river channels themselves to increase the water stagnation period and surface contact area, thereby increasing bank and riverbed infiltration and groundwater recharge in the local aquifers. As per the command area farmers of Puliyancheri, since the pits were dug in the upper reaches of his landholding, the groundwater level has increased by 8 ft in his well, providing him with an additional 3 months of irrigation and increasing the irrigated crop area by 1.2 acres. As per him, it is substantial for earning an additional annual income of Rs. 15000.00. These are cost-effective structures built on the commons, without altering the river course, and with improved flows in the nalas. The following tables provide details on the sunken pit construction in the project clusters.

Table 2.10: Sunken pit construction in Beemandapalli cluster, Krishnagiri dist.

FY	Villages covered	Number of structures	Water storage capacity (Qty in CUM)	Cost
2022-2023	Puliyancheri, Gollapalli	2	470.03	42302.7

Table 2.10a: Sunken pit construction in Thazhaiyuthu cluster, Tiruvannamalai dist.

FY	Villages covered	Number of structures	No. of SFs	Water storage capacity (Qty in CUM)	Cost (Rs)
2024-2025	Thazhaiyuthu, Arattavadi, Porasapattu	17	25	5445.6	490104

2.2.1.1 Beneficiary response to the WRD

District	Village Name	Main source of water	Improvement in water quality	Improvement in water quantity	Irrigation before project	Irrigation post treatment	Who maintains the NRM structure	Availability of maintenance fund	Contribution to maintenance fund	Rate the improvement in the water	Satisfied with the water quality
Krishnagiri	Bhimandapali	well/ bore well	100	100	Flood irrigation	Flood irrigation	User group	Nil/ Can't say	Individuals	Very high	Highly
	Puliya cheri	well/ bore well	100	100	Flood irrigation	Flood irrigation	User group	Nil/ Can't say	Individuals	Very high	Highly
	Gollapalli/Oddur	well/ bore well, , pond	100	100	Flood irrigation	Flood, drip irrigation	Ugs/ Individuals	Cant say/ Available	Households	Very high	Highly
Tiruva nnamalai	Arattavadi	well/ bore well	100	100	Flood irrigation	Flood, drip irrigation	UGs/ Individuals	Available	Households	Very high	Highly
	Porasapattu	well/ bore well, pond	100	100	Flood irrigation	Flood irrigation	UGs	Nil	Individuals	Very high	Highly
	Thazhaiyuthu	well/ bore well, pond	100	100	Flood irrigation	drip, flood irrigation	UGs	Nil	Individuals	Very high	Highly

Individual respondents were asked about their responses to water resources development. They are of the opinion that the activities are in line with their needs and suit the geographic conditions. The structures created in the past were defunct and were producing impact. Hence, the structures created are significant and have created a sustainable water resource in their villages. As per their response, now their major water source is a well or borewell, which is not yielding much, and their cultivated lands are degraded. They mentioned there is a 100 per cent improvement in water quantity and quality, and that irrigated land has increased. The user group is responsible for the maintenance of the structures as it is required. In the meantime, there is no availability of funds; however, they are willing to take care of

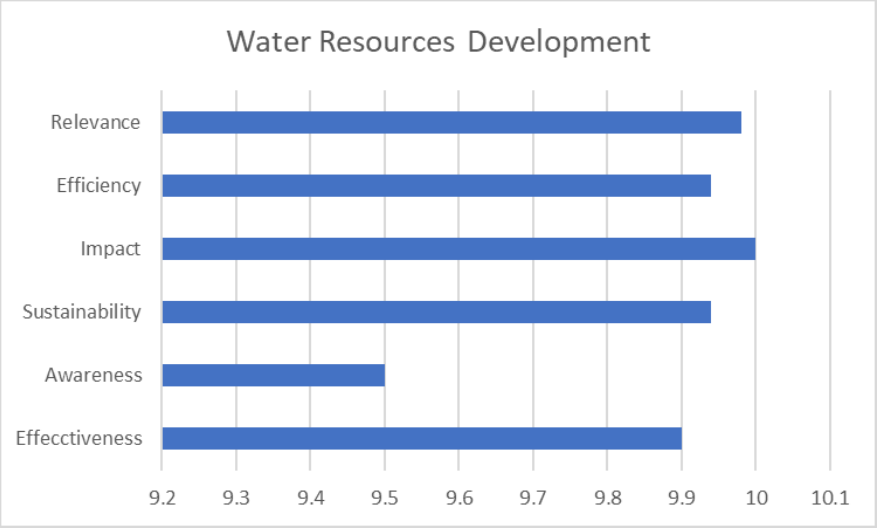
the maintenance of the structure as and when needed, with the help of individuals or the Panchayat. Regarding their response to the most effective structures to improve groundwater, they recognised farm ponds, percolation tanks, and check dams, which have increased groundwater levels by 100 per cent. They expressed satisfaction with all components of the activities under the WRD.

Table 2.11: Beneficiary response on the water resources development in percentage

Village	Most Impacting Structures (as perceived by beneficiaries)	Responsible for Maintenance	Reported Increase in Groundwater (%)
Bhimandapalli	Farm pond, Check dam	User Groups – 35% Individuals – 65%	100
Puliyacheri	Percolation pit / tank	User Groups – 66% Individuals – 34%	100
Gollapalli / Oddur	Farm pond, Check dam	Individuals – 100%	100
Arattavadi	Farm pond, Check dam	User Groups – 67% Individuals – 33%	100
Porasapattu	Farm pond, Check dam	User Groups – 50% Individuals – 50%	100
Thazhaiyuthu	Percolation pit, Check dam	User Groups – 75% Individuals – 25%	100

2.1.1.2 Evaluation of WRD activities based on EASIER Framework

The overall score of the component is 9.88.



Details of individual performance, based on ESIER framework is provided in the following tables:

Effectiveness (Extent to which planned water outcomes are achieved)		
Indicators	Details	Score
Types and number of structures created, and repaired and potential created	About 65 ponds, 15 functional MCD, 26 borewell and well recharge pits, 6 percolation ponds, 43 stretches of 800 mtr each, 2 sunken pits dug in the river bed have created thousands of CuM water storage capacity	10.0

Increased surface water bodies	Ponds, percolation ponds and MCDs are good in number and capable in have addressing more than lakhs of cu mtr of runoff every season.	9.9
Increased water level in the wells	As per the respondent's survey wells within the range of 500 mtr have increase water level by 15 to 20 ft.	10.0
Reduction in overland flow	The overland flow has halved due to surface water storage created	9.9
Water available to irrigate crops	As per the respondents the water available from the well has increased to 10 months in the wells that recharged due to the interventions. Due to recharge of groundwater, now they able to increase irrigation by 80 to 100 percent	9.8
Physical progress of the component	All the targeted structures are achieved within the project period	10.0
Average		**9.9**

Awareness (Level of community knowledge and participation)		
Indicators	Details	Score
Participation of the community in the activity	Ponds created in the private land is due to the community participation and contribution in terms of labour and transportation	10
Community opinion on the groundwater recharge	Community is endorsing and acknowledging the impact of WRD on the well recharge and availability of water for fish farming and irrigation	10
Awareness and willingness of maintenance	Already they are taking care of ponds and MCDs siltation	9.8
Awareness on sharing of water	Individual well is sufficient in meeting their irrigation demand. Water available in MCD and percolation pond is accessible to every VDC members and livestock	10
Average		**9.95**

Sustainability (Long term functionality and upkeep)		
Indicators	Description	Score
WRD structures in working conditions till date	All the surface bodies constructed are filled with water and recharge structures increased water level in the vicinity wells	10
Active Village Development committee and Water user groups	Village Development Committee and Water User Groups are showing their concern and willing to take care of the assets created	9.9
Water availability in the ponds and MCDs	During the visit it was observed that ample water available to meet the beneficiary demand	10
Maintenance by community, water user association	Already taken steps to take care of the structures in the due course of time	9.9
Reduction of silts in the surface water bodies and nala	As per the discussion with the stakeholders that the silt load has reduced considerable due to strategic location and successive structures constructed	9.9
Average		**9.94**

Impact (changes resulting from water interventions)		
Indicators	Details	Score
Increase in groundwater level	Water level in the wells within 500 mtr from the recharge structures improved its water level by 15-20 ft	10
Number of wells recharged	All the wells, bore wells recharged	10
Increased irrigated land and cropping	An increase of 80-100% increase I n the irrigated land	10
Increased agriculture productivity	As per the respondents the productivity and yield have increased by 10, 30 % respectively	10
Trees and fodder development	Due to the increased water availability fallow land have been reclaimed and brough under the Agro-horticulture and fodder development	10
Water availability to cattle and wildlife	Cattle are accessing the water body created in the common land and wildlife like deer, wild boar have sited near the MCDs	10
Livelihood promotion	The pond and village ponds renovated have been brough under fish cultivation and two crops are raised. These ponds are charged by taking water from the river, which has rejuvenated	10
Average		**10**

Efficiency (Optimal use of resources)		
Indicators	Details	Score
Cost effective structures and water storage	From the individual table it can be seen that thousands of CuM of water storage capacity has created	9.9
Target achievement	The agency has achieved 100 targets in the respective implementation period	10
Efficient Renovation and repair of defunct structures	The quality of the structure and cost involved is modest. The structured repaired and renovated is rejuvenated the ponds	10
Community contribution	Community have contributed in the form of labour, transportation of materials	9.8
Convergence with government schemes	Watershed Development Component - Pradhan Mantri Krishi Sinchayee Yojana (WDC-PMKSY 2.0), Pradhan Mantri Krishi Sinchayee Yojana - Watershed Development (PMKSY-WD) Erstwhile Integrated Watershed Management Programme (IWMP), Watershed Development Fund (WDF) assisted by NABARD, and Climate Proofing of Rainfed Watersheds Tamil Nadu under National Adaptation Fund for Climate Change (NAFCC).	10
Average		**9.94**

Relevance (Align with local hydro-geology and Community needs)		
Indicator	Description	Score
Site specific structures	Structures are planned based on the hydrogeology, watershed geography and character, rainfall, irrigation demand of the command area farmers.	10
Alignment with the weather and water demand	All the structures are site specific in nature. Farm ponds built based on the inclination and contribution of the farmers and are situated in the discharge zones of the watershed.	10

Relevance to over exploited and high runoff area	The area is over exploited and erratic rainfall with high runoff degraded the common and private land holdings. The recharging the aquifer and increase the surface water body was major requirements	10
Community acceptance to the structures created	Community identified all the structures that benefit the groundwater recharge irrigation requirement at most needed activities under the project	9.9
Alignment with state watershed plans and CSR objectives	State programmes implemented through the Rural Development and Panchayat Raj Department emphasize integrated water resource management, revival of traditional water bodies, and drainage line treatment, all of which are addressed through these works.	10
	Schedule VII of the Companies Act, 2013, particularly under provisions related to water conservation, rainwater harvesting, environmental sustainability, conservation of natural resources, and rural development.	
Average		**9.98**

2.2.2 Soil and Moisture Conservation (S&MC)

Soil and Moisture Conservation (S&MC) structures constructed in the project villages are playing a critical role in sustaining agriculture and livelihood, which are characterised by low and erratic rainfall, undulating terrain, fragile soils, and declining groundwater levels. In the project villages, a large proportion of rainfall is lost as surface runoff, leading to soil erosion, reduced soil fertility, and limited moisture for crops. The following site-specific low-costing structures are being made under the project.

a. Field bunds

Field bunds are one of the most effective on-farm S&MC measures. These structures help to arrest runoff, increase rainwater retention within agricultural fields, and enhance soil moisture availability in the root zone. By reducing soil erosion and nutrient loss, field bunds improve crop productivity and enable farmers to practice protective irrigation during dry spells, especially in rainfed farming systems. The outlets are also crucial for the safe disposal of field water and save topsoil and nutrient loss from the field. The following tables provide details on the field bunds and outlets constructed under the project and in the project villages. During the assessment period, 43 beneficiaries benefited due to the support provided under the intervention. An average running length of 200 m was constructed in their field. The selection of beneficiaries was based on field conditions and their willingness to participate and contribute to the construction work. According to the beneficiary of the Beemandapalli village, these bunds are helping him in saving his soils and soil moisture which in tern helped to increase yield by 10% and an annual income of Rs.8000.00. Though the structure is cost effective and much needed in the upper reaches, it was not made by them in the past due to low income and return from the cultivation. The project provided them with much-needed support and demonstrated the importance of land levelling and proper bunds for sustainable, climate-resilient cultivation.

Table 2.12: Field bund interventions in Beemandapalli cluster, Krishnagiri Dist.

FY	Villages covered	Number of beneficiaries	Gender%	Water storage capacity created (Qty in CUM)	Cost (Rs.)
2022-2023	Gollapalli, Beemandapalli, Oddur,	27	4	3238.5	291465
2023-2024	Gollapalli, Beemandapalli, Oddur,Puliyancheri	77	10	8719.98	784798.2
2024-2025	Beemandapalli, Oddur, Gollapalli	22	0	2098.8	188892

Total	Gollapalli, Beemandapalli, Oddur,Puliyancheri	126		14057.28	1265155

Table 2.12a: Field bund interventions in Thazhaiyuthu cluster, Tiruvannamalai Dist.

FY	Villages covered	Number of beneficiaries	Gender %	Running length (mtr)	Water storage capacity created (Qty in CUM)	Cost (Rs.)
2023-2024	Thazhaiyuthu, Porasapattu, Arattavadi	134	39	34321.04	20576.66	1851899
2024-2025	Thazhaiyuthu, Porasapattu, Arattavadi	21	19	9483.34	5648	508320
Total				43804.38	26224.66	2360219

b. Loose Rock (boulder) Check Dam (LRCD)

Constructed across tiny streams and drainage lines, loose rock check dams slow flow velocity, encourage sediment deposition, and improve downstream groundwater recharge. These structures stabilise stream channels, prevent further land degradation, and greatly aid the revitalisation of shallow wells and borewells in hard-rock, semi-arid areas of project communities. These are the reasonably priced gully-plugging structures installed in the watershed's transition zones. A number of inexpensive LRCDs are built on nalas in the project villages to reduce runoff and improve bank infiltration and soil moisture in surrounding areas. No LRCDs were built in the project area during the assessment period, but structures built the year before were visited and their effects on the project villages' soil and water regime were recorded. According to the beneficiaries of Beemandpalli, these constructions are inexpensive, but the increase in well water has a significant impact. According to the beneficiary of the command area, it enabled him to have a higher water yield in his well and an extra month of irrigation.

Table 2.13: LRCD construction in Beemandpalli cluster, Krishnagiri Dist

FY	Villages covered	Number of village common land	Water storage capacity created (Qty in CUM)	Cost (Rs)
2023-2024	Gollapalli, Beemandapalli, Paraiyur	3	41.348	1653.92

Table 2.13a: LRCD construction in Thazhaiyuthu cluster, Tiruvannamalai Dist.

FY	Villages covered	Number of Structures	SF Nos covered (No)	Water storage capacity created (Qty in CUM)	Cost (Rs)
2023-2024	Porasapattu, Arattavadi, Thazhaiyuthu	6	6	103.35	4134

c. Plantation in village commons

By increasing vegetative cover, plantations and undergrowth built on bunds, wastelands, and common lands enhance the physical S&MC structures. Plantations of trees and undergrowth vegetation, such as grass and bushes, improve microclimatic conditions, increase organic matter, decrease erosion, and strengthen soil binding. Additionally, they provide a consistent supply of dry, green fodder, which reduces strain on grazing and forest areas and sustains livelihoods dependent on animals during dry spells. These planted trees are growing very well and have stored a

significant amount of carbon. Increased shade and canopy provide food, refuge, and nesting places for birds, many insects, squirrels, and arboreal mammals. The food web of the forest ecosystem is built on the breakdown of organic matter in the undergrowth, which enriches the soil and supports a wide variety of microbes, fungi, and invertebrates. The pits dug in the commons benefitted 71 individuals and helped to address 5900 CuM of runoff. During the assessment period, no plantation was undertaken in the project villages. To document the impact, the plantation sites Beemandpalli and Porasapattu were visited. According to the villagers, these trees, once mature, may yield a good return on the investment. Timber species such as Mahugani, Teak, etc., and fruitbearing species such as Jamun, mango, etc., are planted under the intervention. The following table provides details on the plantation pits and the planting of trees in the village commons.

Table 2.14: Plantation pits in Beemandpalli cluster, Krishnagiri district

FY	Villages covered	Number of beneficiaries	Gender%	Water storage capacity created (Qty in CUM)	Cost (Rs)
2023-2024	Beemandapalli	71	14	5900	531000

Table 2.15: Plantations on the village commons in Beemandpalli cluster, Krishnagiri district

Financial Year	Village Covered	Number of Plantations	% of Total Plantations	Trees on Common Land (No.)	% of Total Trees	Cost (₹)	Survival (%)	Growth
2022–2023	Beemandapalli	4	5.0	1,149	19.32	5,34,285	88	Excellent
2023–2024	Beemandapalli	1	0.6	360	3.54	1,67,400	92	Excellent
Total	—	5	2.8	1,509	11.43	7,01,685	90	—

Table 2.15a: Plantations on the village commons in Thazhaiyuthu cluster, Tiruvannamalai district

Financial year	Villages covered	Common land	No of trees	Survival%	Growth	Cost (Rs)	Survival%	Growth
2022-2023	Thazhaiyuthu, Porasapattu	11	1189	92	Very good	552885	84	Excellent
2023-2024	Porasapattu	1	10	84	Very good	4650	88	Excellent
Total		12	1199	88	Very good	557535	86	

d. Fodder, vetiver slips

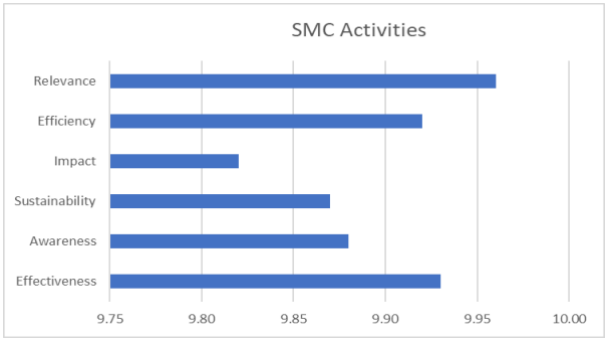
Fodder slips (such as high-yielding Co-4 and Co-5 varieties and grasses like guinea grass) and vetiver slips (rooted slips of *Chrysopogon zizanioides*) are produced and distributed to farmers to improve on-farm fodder availability and soil health in the State of Tamil Nadu. Based on learnings from elsewhere under the project, vetiver slips were provided to the 60 beneficiaries of the Thazhaiyuthu cluster during 2023. These slips lessen reliance on purchased fodder and the strain on shared grazing areas by establishing perennial fodder plots that supply cattle with wholesome nutrition during lean seasons. According to field visits, the vetiver planting serves two purposes: it stabilises soils, reduces erosion on slopes and field edges, and improves moisture retention due to its deep root system. This helps preserve soil structure and lessen runoff, supporting attempts to conserve soil and moisture in the semi-arid agricultural terrain of the Thazhaiyuthu cluster. Thus, in addition to conserving soil, these measures enhanced the Thazhaiyuthu cluster's ecological resilience and livestock productivity.

Table 2.16: Plantation of Vetiver slip in Thazhaiyuthu cluster, Tiruvannamalai dist.

Financial year	Villages covered	Number of beneficiaries	Gender %	Vetiver Slips	Fodder Sorghum Seed	Hedgelucerne Seed	Agathi Seed	Cost
2022-2023	Thazhaiyuthu, Arattavadi, Porasapattu	60	15	82000	0	0	0	330000

2.2.2.1 Evaluation of S&M conservation activities based on EASIER Framework

The Overall score based on the ESIER Framework for SMC is 9.90. The details of the same are provided in the following boxes.



EASIER	Score
Effectiveness	9.93
Awareness	9.88
Sustainability	9.87
Impact	9.82
Efficiency	9.92
Relevance	9.96
Average	9.90

The following are the individual aspects of the ESIER framework.

Effectiveness (Extent to which SMC objectives are achieved)		
Indicators	Description	Score
Field bund length and runoff addressed	About 69000 running meter field bund with proper outlets is able to address more than 40000 CUM of runoff water and increase the field potential	9.9
Functioning LRCD	Losse rock check dams are now filled with silt is indicating its effectiveness in protecting the water bodies and nala from siltation	9.9
Success of vetiver slips and plantations	About 82000 slips are well established and protecting the local soil from erosion besides meeting the fodder demand. Villagers are themselves introducing it several field bunds, slopy land	9.9
Reduction in the runoff, soil erosion and flooding	As per the respondents it is effective in combating siltation in the water bodies and protecting the field from topsoil removal	9.9

Increased soil moisture	Beneficiary is acknowledging the field bund for restoration of his fallow and raising crops	10
Groundwater recharge in the command area	It has considerable impacts due to the field bund and LRCDs which improved the due to the better contact area and duration, which helped to percolate and recharge the groundwater	10
Average		9.93

Awareness (Level of farmer and community knowledge)		
Indicators	Description	Score
Community awareness on soil erosion and land degradation	Community is now realised the importance of field bund in protecting the cultivated land. They started maintaining the field bund on annual basis	9.8
Knowledge of maintenance of structures created	They are maintaining the field bund and keeping the outlet ready for safe disposal of flooding water	9.8
Awareness about the contribution of structures	Based on the ease of cultivation and reduced irrigation and growth of trees they are reporting it as an important intervention in sustainable agriculture	10
Participation of the Village Development Agency	VDCs are playing very important role in decision making and successful implementation of the project. They are available all the time during the implementation and all other activities.	10
Awareness on climate resilient land conservation	They are now realising their apathy and changed rainfall pattern is the reason for poor return from cultivation and horticulture. Water and soil conservation is important to the today's context in their type land and climatic conditions	9.8
Average		**9.88**

Sustainability (Long-term continuity and upkeep)		
Indicator	Description	Score
Reduction in soil erosion and current	LRCD and field bund, vegetative cover has substantially reduced silt load in the nala and also from the flash flood. Conversion of fallow land to cultivated land and silt deposited in the LRCD are a few examples to claim that the structures made are helping to arrest the silt and reduction in the erosion.	9.8
Sediment trapped behind structures	More than 3/4th of the LRCD is filled with sediments	9.8
Survival rate of Vetiver slip and plantation	Very high and promoted further due to its dual advantage and benefits	10

Reduction in silt flow to the rainwater harvesting structures	The renovated village ponds and newly constructed ponds are silt free	9.8
Reduction in field maintenance in the treated fields	Due levelling and field bund creation the annual cost of soil work in the field has reduced substantially	9.9
Willingness of community to maintain the structures	Community have reported that they have taken appropriate decision to maintain the structures as and when it is required. The individual farmers are already taking care of the farm ponds built in their fields.	9.9
Average		**9.87**

Impact (Changes due to SMC interventions)		
Indicator	Description	Score
Reduction in soil loss	Decreased flood water enter into the field and new soil deposition has been addressed. Beneficiary reported that the soil loss from the field is nil or negligible	9.8
Improvement in soil moisture, fertility and biomass	The ground biomass and reduced irrigation are a few examples in this case	9.8
Increase in crop yield	The yield has increased upto 15%	9.8
Increased cultivated land	Beneficiary have reported that the field bund has helped them to cultivate and at house hold scale there is an increase in cultivated land	10
Reduced silt load in the nala	Nala are not receiving less silt from the cultivated landscape due to the field bunds. The nala clearance found to be a successful intervention	9.8
Enhanced livelihood security in rainfed farming	Due to the conversion of fallow land to cultivated land and supporting agro-horticulture and fodder development improved the livelihood at household level	9.7
Average		**9.82**

Efficiency (Optimal use of resources)		
Indicator	Description	Score
Cost-effective structures	The structures, Field bund and LRCD costed Rs 90 and Rs 40 per CUM, which is reasonable. The cost per ha vetiver slips and plantation is within the budget of the activity. All the activities completed within the allocated budget.	10
Timely completion of the work	The activities have been achieved well within the time allocated in the DPR	10
Use of locally available material to construct the structures	All the structures are build using the locally available boulders, stones and soils. Plants used are native.	10

Wages generated from the work	Local villagers have been involved in t eh construction work. However, the activity also involved machinery to complete the work in time.	9.6
Improvement in the survival and growth of trees	The survival rate of plants is more than 90%, which is good looking at the climatic conditions and moisture availability in the village commons	10
Average		**9.92**

Relevance (Alignment with local conditions and needs)		
Indicators	Description	Score
Suitability of the structures created in the project villages	Low-cost, nature-based interventions are well suited to the area, which is suffering from erratic rainfall, degraded land, moisture stress and limited soil depth. Loose boulder check dams effectively reduce runoff velocity and gully erosion, enabling gradual groundwater recharge. Vetiver slips and plantations stabilize slopes, enhance soil binding, and improve moisture retention while increasing green cover on degraded commons.	10
Community endorsement and acceptance	Activities have received strong community endorsement and acceptance in the project villages. Farmers recognize the tangible benefits of these measures in reducing soil erosion, conserving rainwater, and improving soil moisture. Visible improvements in crop performance, stabilization of gullies, and enhanced green cover have further reinforced community confidence, leading to willingness to protect, maintain, and replicate these practices across individual farms and village commons.	10
Suitable to the field size and cropping	The beneficiaries are small and marginal land holders. Due to their limited resources and degraded landscape, they were not cultivating and land become unproductive. These cost effective and high impact structures like field bund and inlets and much suitable to the field size and landscape	10
Inclusiveness of local farmers	Farmers are involved in all stages of the interventions and gender participation is also ensured.	9.8
Consistency with the State watershed program and CSR priorities	The loose boulder check dams, field bunds, vetiver slips, and plantation on village commons align with the Government of Tamil Nadu's watershed approach, which emphasizes ridge-to-valley treatment, in-situ moisture conservation, groundwater recharge, and restoration of degraded commons. These interventions also closely match CSR priorities under Schedule VII of the Companies Act, 2013, particularly in the areas of environmental sustainability, conservation of natural resources, climate resilience, and rural development.	10
Average		**9.96**

2.2.3 Plantation and Agriculture development

An integrated strategy that incorporates agroforestry, agro-horticulture, fodder development, and sustainable farming techniques has boosted plantation and agricultural development in the project region. By combining trees, fruit crops,

and annual crops, agroforestry and agro-horticulture systems enhance soil health, microclimate, and long-term productivity while promoting farm revenue diversification. Additionally, tree-based systems improve resilience to climatic variability and help conserve soil and moisture.

Home vegetable gardens and fodder plots are essential for maintaining household nutritional security and livestock-based incomes. While home vegetable gardens and vegetable pandals give access to fresh, nutrient-dense vegetables, especially for women and smallholder households, and provide opportunities for additional income, fodder cultivation guarantees year-round availability of green biomass for cattle, reducing reliance on external fodder sources.

Utilizing organic inputs like Azolla, vermicompost, and Panchakavya tanks promotes affordable and sustainable farming. While vermicompost improves soil structure, microbial activity, and nutrient availability, azolla cultivation offers livestock and poultry birds a protein-rich supplement. Liquid organic formulations based on panchakavya enhance plant immunity, encourage crop growth, and lessen dependency on chemical inputs.

By diversifying crops, intercropping with appropriate seed varieties increases soil fertility, reduces production risk, and improves land-use efficiency.

When combined, these plantation and agricultural development initiatives bolster food and livelihood security in rural communities, increase farm productivity and incomes, and support ecologically sustainable farming.

i. Agro-Forestry and Agro-Horticulture

During the assessment period, 109 plantations in the Beemandpalli cluster and 103 in the Thazhaiyuthu cluster had survival rates of 99% and 98%, respectively. In all, during the assessment period, 18236 saplings were planted by the beneficiaries on their landholdings. During the entire project period, 18904 in Beemandpalli and 33259 in Thazhaiyuthu clusters. Under the agroforestry model, major species include mahogany, jamun, pongamia pinnata, wild neem, and neem, whereas in the agrohorticulture model, major species include mango, guava, sapota, and citrus. The mahogany growers are expecting a good return after 20 years. Mr Erappan of Beemandpalli village planted 80 mango seedlings in 2022-2023 on his 95-cent barren land, and he expects the first crop in 2026. Along with Mango, he is now cultivating crops like horse gram and groundnut. He attributes the restoration of his barren land to the agro-horticulture model.

Table 2.17: Agro-Forestry and Agro-horticulture in Beemandpalli cluster, Krishnagiri Dist.

Financial year	Villages covered	Plantations	Female%	Total trees	Cost	Survival%	Growth
2022-2023	Beemandapalli, Gollapalli, Puliyancheri	74	20	4797	2230 605	94	Excellent
2023-2024	Beemandapalli, Puliyancheri, Oddur, Paraiyur, Gollapalli	181	17	9798	4556 070	96	Excellent
2024-2025	Beemandapalli, Puliyancheri, Oddur, Gollapalli	109	9	4309	2003 685	99	Excellent
Total		364	15.33	18904	8790 360	96	

Table 2.17a: Agro-Forestry and Agro-horticulture in Thazhaiyuthu cluster, Tiruvannamalai district.

Financial Year	Villages Covered	Number of Beneficiary Households *	Women Beneficiaries (%)	Total Saplings Distributed (No.)	Agro-Horticulture (No.)	Agro-Forestry (No.)	Cost (₹)	Survival (%)	Growth
2022–2023	Arattavadi, Thazhaiyuthu, Porasapattu	194	24	5,415	2,582	2,833	25,17,975	94	Excellent
2023–2024	Arattavadi, Thazhaiyuthu, Porasapattu	222	11	13,917	8,322	5,595	64,71,405	96	Excellent
2024–2025	Arattavadi, Thazhaiyuthu, Porasapattu	103	24	13,927	8,322	5,605	64,76,055	98	Excellent

Total	—	519	20	33,259	19,226	14,033	1,54,65,435	96	Excellent

* On an average 20 cents per beneficiary land is brought under Agro- Forestry/Horticulture ii.

Fodder plots

Fodder plots have been established by farmers using the inputs provided by the NAF. Farmers are trained and guided to raise fodder plots. During the assessment period, no new fodder plots are established under the project head. However, for the impact assessment, we visited Puliyancheri and the Beemandpalli cluster and interacted with Mr Annamalai. Annamalai raised fodder species like Sorgam, Grass (Co4), Agati, Mulberry, and Hedge Lucerne in his home garden. Along with the fodder, he also planted drumstick to earn a livelihood. Now he is totally relying on the fodder from his plot to feed his 4 milking cattle. He is now earning about Rs. 400 by selling milk. Details on the fodder plots in both clusters are furnished in the following tables.

Table 2.18: Fodder plots in Beemandpalli cluster, Krishnagiri dist.

Financial year	Villages covered	Number beneficiaries	Gender%	Number of kit (Seeds of sorghum, lucerne, agathi)	Cost
2022-2023	Beemandapalli, Oddur, Gollapalli, Puliyancheri	35	9	35	192 500

Table 2.18a: Fodder plots in Thazhaiyuthu cluster, Tiruvannamalai dist.

Financial year	Villages covered	Number beneficiaries	Gender %	Fodder Sorghum Seed	Hedgelucerne Seed	Agathi Seed	Cost
2023-2024	Thazhaiyuthu, Arattavadi, Porasapattu, Porasapattu (PL Thanda)	169	23	150	150	75	929500

iii. Home gardens

Home gardens are well received by beneficiaries due to their low input costs and quick returns.
Twenty native seed varieties, including five types of green leafy vegetables, bhendi, brinjal, chili, broad bean, tomato, red gram, bitter gourd, snake gourd, bottle gourd, ridge gourd, ash gourd, etc., were provided to each beneficiary. During the assessment period, 75 beneficiaries in the Thazhaiyuthu cluster were provided with seed kits. Details on the home garden in both clusters are furnished in the following tables. During the field visit, the team interacted with the beneficiary, Mr Sankar, in Thazhaiyuthu village. He has raised a home garden in his 10-cent land and expressed satisfaction. He is of the opinion that it is improving the family's nutritional intake. Money spent on market-bought vegetables has reduced. The home garden is now completely cultivated without any chemical inputs. The vegetables produced are free of harmful chemicals. Fresh produce is readily available for consumption as and when it is needed. The quantity produced is now only meeting his household requirements; hence, he is not in a position to report the exact monetary benefit from the activity.

Table 2.19: Home/ kitchen garden kits Beemandapalli cluster, Krishnagiri dist.

Financial year	Villages covered	Number of Beneficiaries	Gender %	Number of kit (Seeds)	Cost
2022-2023	Beemandapalli, Oddur, Gollapalli, Puliyancheri	100	23	100	35000

2023-2024	Beemandapalli, Oddur, Gollapalli, Puliyancheri	150	29	150	52500
2023-2024	Beemandapalli, Oddur, Gollapalli, Puliyancheri	85	45	85	29750

Table 2.19a: Home/ kitchen garden kits, Thazhaiyuthu cluster, Tiruvannamalai Dist.

Financial year	Villages covered	Number beneficiaries	Gender %	Number of kit (Seeds)	Cost
2023-2024	Thazhaiyuthu, Arattavadi, Porasapattu, Porasapattu (PL Thanda)	164	86	164	57400
2024-2025	Thazhaiyuthu, Arattavadi, Porasapattu	75	51	75	26250

iv. Vegetable pandal

Vegetable pandal activities were introduced in the project villages to provide regular income to farmers. Rs. 207740 per beneficiary was paid to establish 10 cent Trellis. Visited beneficiary Mr. Shivlingam, Puliyancheri village to assess the impact. He has raised 10 sent vegetable pandal with a cost of Rs. 25000.00 He raised Bitter guard and harvested 80 kg in the first crop. He mentioned that 20-24 number of vegetable crops can be sown and harvested in a single year. Subsequently, he raised cluster beans and harvested 60 kgs. He reported that he is earning an additional income of Rs. 10,000/- from the Pandal by spending just an hour per day. He is planning to install drip irrigation to enhance productivity. Details on the Vegetable pandal is provided in the following table

Table 2.20: Vegetable pandal Beemandapalli cluster, Krishnagiri dist.

Financial Year	Villages Covered	Number of Beneficiaries	Male Beneficiaries (%)	Number of Pandals (No.)	Average Size (cents)	Cost (₹)
2023–2024	Puliyancheri, Beemandapalli, Oddur, Gollapalli	10	100	10	10	2,07,740

Table2.20a: Vegetable Pandal, Thazhaiyuthu cluster, Tiruvannamalai Dist.

Financial year	Villages	Number of beneficiaries	Gender %	Quantity (No. of Pandals)	Average size (cents)	Cost
2023-2024	Thazhaiyuthu, Aratvadi, Porasaopattu	5	20	5	10	103870

v. Organic inputs

Organic input has also been received well in the area. Only locally available inputs can produce various kinds of organic inputs while using the tanks provided by the implementation agency. Under the project, Vermicompost tanks, Panchakavya tanks, and Azolla-raising tanks were provided to the beneficiaries. During the assessment period no organic inputs were provided. The tanks provided earlier are still in use. The vermicompost tank provided is an example of the circular economy. The agency procured used lubricant tanks, cleaned them, and provided them to the beneficiary for vermicomposting. It is well received, as the beneficiary has a good number of cattle, and gung is used to prepare compost and is used in paddy and other cereal cultivation. Farmers were primarily using chemical fertilizers prior to the project. Farmers are now willing to use less chemical-intensive agriculture as a result of the training and capacity-building. Thus, these organic farming input-producing units encourage farmers to practice organic farming. The beneficiary has successfully propagated the Azolla and vermicompost units, and farmers are sharing the earthworms and Azolla with others to multiply the units. Because fewer chemical inputs are used in cultivation, the component helps restore soil fertility. Purchased chemical inputs, like as fertilizers and pesticides, are less expensive. According to one of the beneficiaries, vermicomposting allows him to save roughly Rs. 2000 every crop.

Saravanan from Porasuputtu shared his experience of using a 1000-liter tank to produce compost in 4-5 batches annually. Initially investing Rs. 4000, he now reaps benefits of about Rs. 10,000 per year by applying the manure to his paddy fields and vegetable crops. With 8 cattle at his disposal, Saravanan has an ample supply of cow dung for vermi-composting. He has successfully reduced fertiliser inputs by half and anticipates further
reductions. Additionally, production has increased from 20 to 25 bags (each weighing 75 kg) per acre.

Saravanan's success has inspired fellow villagers to approach him for understanding composting and its benefits. While water usage has not changed significantly, Saravanan believes that, over time, water consumption will also decrease. Farmers have reported the effectiveness of vermicompost in vegetable cultivation, with some earning up to Rs. 10,000 per half-acre plot in a single season. The following table provides details on the organic inputs in the project villages.

The agency's shallow polyester tank is used to raise Azolla. Originally supplied, Azolla seeds are now shared by farmers, and several instances of Azolla cultivation may be observed in the villages.

To cover the needs of cattle and poultry, 2.5 to 5 kg of fodder can be extracted from the Azolla tank. It saves roughly 10-15 rupees a day on cattle feed. Farmers have stated that Azolla has increased their milk yield and improved milk prices.

The Panchagavya tank is in use by the organic cultivators. The cost-effective tank serves to reduce farming inputs by 1000 to 1500 per acre per crop. Farmers prepare Panchagavya after receiving training from KVKs using locally available ingredients – indigenous cow dung, cow urine, cow milk, cow ghee, jaggery, coconut water, ripened banana, and water. In a defined proportion, it is mixed and kept it for 30 days. The mixture then be mixed with water and applied to the field. The farmer also reported that, due to the use of these organic inputs, pest and disease levels have reduced.

Table 2.21: Organic inputs Beemandpalli cluster, Krishnagiri Dist.

FY	Beneficiaries	Gender %	Organic inputs			Cost
			Vermicompost Beneficiary	Azolla Beneficiary	Panchakavya Beneficiary	
2022-2023	96	40	60	75	30	1392000

Table 2.21a: Organic input Thazhaiyuthu cluster, Tiruvannamalai Dist.

			Organic inputs			Cost
Year	Total Beneficiaries	Gender%	Azolla Beneficiary	Vermicompost Beneficiary	Panchakavya tank Beneficiary	
2022-2023	65	8	51	58	7	942500

During the assessment period, in the Beemandpalli cluster, a kit containing the seeds of red gram, Cowpea, and Lablab was provided to 25 trained farmers to improve their farming output and enhance climate resilience in cultivation. By reducing reliance on chemicals and ensuring food security, it contributes to sustainable farming by boosting farm productivity, improving soil health (nitrogen fixation from legumes, reduced erosion), supporting natural pest and disease control, promoting efficient resource use, and enhancing economic stability through diversified income. A

crucial strategy for the project villages' varied farming systems is the cultivation of complementary crops, which maximise land, sunlight, and water use while protecting against single-crop failures. Even though the agency introduced it, the entire town will soon adopt it. The following table provides details on the intervention.

Table 2.22 : Intercropping input (Seeds of Red gram, Cowpea, Lablab), Beemandapalli cluster, Khrishnagiri

FY	Villages covered	Number beneficiaries	Gender	Total kit	Cost
2024-2025	Puliyancheri, Beemandapalli, Oddur	25	8	25	5000

2.2.3.1 Respondents' response to the agriculture development

Respondents were asked to provide their responses to agriculture-related development and capacity-building activities under the project. Respondents are positive on the activities carried out in their respective villages. 88% of respondents acknowledged receiving agri-support and participating in demonstrations and composting. They also acknowledged the input from the agritech training sessions. They identified the new horticulture and vegetable crops as beneficial to them. They also highlighted the expert support to improve their cultivation. They reported that cultivated land has increased due to S&M, with plantation models averaging 0.12 to 0.24 acres per household. They also reported that the cropping pattern has improved, and now they are raising legumes, sorghum, raagi, vegetables, Cucurbitaceae, black gram, mango, and other fruit-bearing trees along with paddy and groundnut. Overall, they agree that the training, capacity-building programs, and field demonstrations helped shape their agricultural activities.

Table 2.23: Respondents response to the agriculture development

District	Village Name	Agri Support Received (%)	Demonstration – Agriculture (%)	Compost / Organic Input (%)	Agri-tech Training Support (%)	New Crops Introduced	Support from Experts (%)	Increase in Cultivated Land (acre/HH)	Cropping Pattern Before Project	Cropping Pattern After Project
Krishnagiri	Bhimandapalli	63	25	25	50	Horticulture, Vegetables	63	0.12	Paddy, Banana	Paddy, legumes, sorghum (fodder), banana, mango
	Puliyancheri	100	33	33	100	Horticulture	100	0.233	Paddy only	Paddy, ragi, mango
	Gollapalli / Oddur	100	33	100	100	Vegetables, Horticulture	100	0	Paddy	Paddy, vegetables, cucurbitaceae
	Average	87.67	30.33	52.67	83.33	—	87.67	0.12	—	—
Tiruvannamalai	Arattavadi	67	33	100	100	Vegetables, Horticulture	67	0.15	Paddy, groundnut	Paddy, groundnut, black gram, vegetables
	Porasapattu	100	33	100	100	Vegetables, Horticulture	100	0.05	Paddy	Paddy, vegetables, groundnut, black gram
	Thazhaiyuthu	67	0	100	100	Vegetables, Horticulture	100	0.53	Paddy, groundnut	Paddy, sericulture, groundnut
	Average	78	22	100	100	—	89	0.24	—	—

Table 2.24: Respondents response on the agriculture development

District	Village Name	Increase in Yield (%)	Annual Agricultural Income Increase (%)	Market Support Available	Received Quality Planting Material (%)	Perceived Improvement in Yield	Primary Reasons for Yield Improvement
Krishnagiri	Bhimandapalli	25	50	No	25	Moderate – 40% Very High – 60%	Quality inputs, reduced cost of cultivation, crop diversification
	Puliyancheri	50	90	No	67	High – 33% Very High – 67%	Crop diversification
	Gollapalli / Oddur	38	60	Yes (50%)	100	Very High – 100%	Crop diversification, reduced input costs
	Average	**37.67**	**66.67**	—	**64.00**	—	—
Tiruvannamalai	Arattavadi	17	10	No	100	Very High	Low cost of inputs
	Porasapattu	57	27	No	100	Very High	Low cost of inputs
	Thazhaiyuthu	36.5	33	No	100	Very High	Low cost of inputs

Specific questions were asked to document the impact of the plantation on the respondents. They reported that Krishnagiri and Tiruvannamalai farmers planted an average of 93 and 76 plants, respectively, on their land, with an average of 0.3 and 0.31 ha, respectively. The average survival is about 88% and 91% with moderate, high, and very high growth rates. The type of plantation they followed is block, boundary, and mixed plantation. They believe that plantations have a significant impact on soil conservation. They also reported that the undergrowth and grass cover have also increased in the plantation areas.

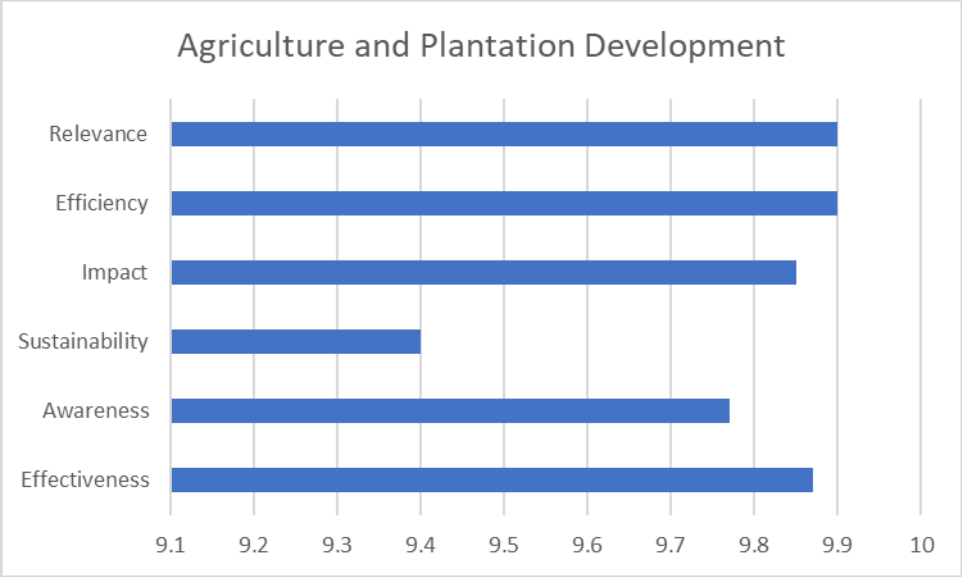
Table 2.25: Respondents response to the plantation

District	Village Name	Average No. of Plants Planted	Species Type	Average Area Planted (ha)	Average Survival (%)	Type of Plantation	Impact on Soil	Growth – Plantation	Increase in Vegetation / Grass Cover
Krishnagiri	Bhimandapalli	60	Indigenous	0.47	80.0	Block, Boundary, Mixed	Very high reduction in soil erosion	Moderate – 33% High – 67%	High – 67% Very High – 33%
	Puliyancheri	95	Indigenous	0.28	95.0	Boundary, Block	—	Very High	Very High

	Gollapalli / Oddur	125	Indigenous	0.16	87.5	Block, Boundary, Mixed	—	Very High	Very High
	Average	**93.33**	—	**0.30**	**87.50**	—	—	—	—
Tiruvannamalai	Arattavadi	65	Indigenous	0.283	86.67	Boundary, Mixed	—	High – 65% Very High – 35%	Very High
	Porasapattu	115	Indigenous	0.20	87.5	Mixed, Block	—	High & Very High – 50%	Very High
	Thazhaiyuthu	48	Indigenous	0.45	98.75	Mixed, Block	—	Very High	Very High
	Average	**76.00**	—	**0.31**	**90.97**	—	—	—	—

2.2.3.2 Evaluation of agriculture Development activities based on EASIER Framework

The Overall score of Agriculture and plantation development is 9.78.



EASIER	Score
Effectiveness	9.87
Awareness	9.77
Sustainability	9.4
Impact	9.85
Efficiency	9.9
Relevance	9.9
Average	9.78

Following are details of the evaluation of the component:

Effectiveness (Extent to which planned agriculture and plantation objectives are achieved)		
Indicators	Description	Score
Area covered under Plantation (Agro-Forestry and Agro-horticulture)	As per the records two models Agro-forestry and Agro-horticulture were introduced on village common land and private land. More than 54 thousand saplings were planted, and more than 1000 plantation sites were established.	10
Survival and growth of the saplings planted	The survival is 90% in the village commons and 98% in the private land holdings	9.8
Established fodder plots and vegetable pandals	354 fodder plots, 574 home garden and 15 vegetable Pandals with average size of 10 cents each.	9.9
Functional home gardens and return	Home gardens are mostly functional and the older home gardens have limited to fewer vegetable varieties due to limitation with the seed preservation	9.6
Adoption of organic farming	The Vermicomposting and Panchakavya have been received well, and they are effective due to availability of cow dung and reduction in the farming input cost.	9.9
Increased land productivity	It has been reported that the farming output has increased by more than 10%	9.9

Target achieved in time	The activities have been achieved well within the implementation time period.	10
Average		**9.87**

Awareness (Level of knowledge and capacity built)		
Indicators	Description	Score
Awareness on tree plantation	During the orientation and awareness programs conducted have highlighted the importance of drought-tolerant native species that are well suited to the semi-arid conditions. Economic return from the trees is better understand due to the growth and market value of the timber, fodder, fuelwood, fruit, and shade for livestock	10
Knowledge on fodder and benefits of fodder plots	Fodder requirement has increased over the years because of the increased cattle population and dairy business. The fodder harvested from Azolla and fodder plots have increased their profit margin.	9.8
Awareness on nutrition and dietary diversity due to home garden	Household are keeping about 2 litres of milk for household consumption and vegetables are consumed self, which diversified their dietary intake and nutrition.	9.6
Understanding on the effective use of vegetable pandals	It has been seen that the 10 cents area is producing 4-5 types of crops in a year and good annual return. They are aware that the investment made is worthwhile in earning higher return	10
Skilled in organic input production	Over the years the farmers are now skilled in preparation of vermicompost and Panchakavya and their application to raise cereals and vegetables.	9.6
Knowledge on soil health and crop diversification	The capacity building programs related soil health and soil health card given them enough knowledge on the various parameters of soil and application of fertilizer. Further they have now practiced better crop rotation due to the water availability and organic input	9.6
Average		**9.77**
Sustainability (Long-term continuation and resilience of interventions)		
Indicators	Description	Score
Survival and growth of tree saplings	An average more than 90% survival and very good growth has been recorded in both models. The Mahogony attained good height and girth, and farmers may get a good return when they reach an age of 20 years	10
Increased shade and soil conditions	As recorded the beneficiary, the trees shade and undergrowth (herbs and grass) is important for their cattle and goat rearing. The crops raised below is yielding better especially in restored land under the agro-horticulture model.	9.9
Reduction in the chemical input in cultivation	The organic input is helping them to reduce input cost also to improve soil moisture. The complete organic cultivation is yet to be in practice; however, the vegetable cultivation is dependent on the organic input	9.6
Fodder plots continuity	Fodder plots are expanding due to the increased livestock in the villages. Farmers are sharing the seeds, suckers and rhizome	9.9

Integrated farming (Trees and crops)	It has been reported by the beneficiary that he has converted his fallow land into agro-horticulture. Due to this there is an increase in the cultivated land in the project villages	10

Farmer capacity for seed and input preparation	Farmers are not able to preserve seeds of all the vegetable varieties; however, they are capable in preserving fewer varieties such as Chilli, tomato, etc. Because to preserve other varieties they need more skill	7
Average		**9.4**
Impact (Changes in livelihoods, nutrition, and environment)		
Increased income from vegetables, fodder, agro horticulture	The beneficiary reported that about 70 kg chilli harvested in a season and fodder is not sold and consumed by their livestock, the fruit bearing trees is yet yield fruits and farmers are expected there will be good return in the coming season	9.8
Improvement in fodder availability and reduction in livestock dietary cost	More fodder plots have been established by the dairy farmers, because it is meeting more than 20 percent of the feedings and increased savings	9.6
Increased cultivated land due to plantation	As per the one beneficiary he is able to restore his 95-cent land into agro-horticulture and able to harvest two crops in year on that land. Overall, due to agri-horticulture the cultivated land has increased in the project villages	10
Improved women participation in the activity	There is considerable improvement in the share of women beneficiary in the project activity.	10
Average		**9.85**
Efficiency (Optimal use of resources)		
Cost per beneficiary on the activity	All the activities well within the allocated budget, the seed kid of 20 different seeds costed Rs350 and Vegetable pandal for 10 cents was about 20000. It is worthwhile to report here that the beneficiary contribution is about 30 to 80 percent in establishing the garden and plot. Similarly for compost unit also the beneficiary contributed in the form labour and material.	10
Reduction in farming input due to organic support	As per the beneficiary they are able to save Rs.1500 to Rs.4000 on the fertilizer	9.8
Convergence with the State schemes	Interventions align closely with state initiatives including State Organic Farming Policy, the National Mission on Sustainable Agriculture, the Horticulture Department's home garden and nutrition garden schemes, and watershed-linked livelihood programmes	9.8
Timely completion of the targeted work	From the physical and financial progress data provided by the PIA, All the planned activities are completed in time well within the allocated budget.	10
Average		**9.9**
Relevance (Alignment with local needs and agro-climatic conditions)		
Suitability of the species and model	The species provided and made available to establish the agroforestry and agro-horticulture are native species and suitable to the agroclimatic region. The vegetable varieties are already raised in the district	9.8
Relevance to the small farmer and marginal land holdings	The marginal farmers identified the home garden and vegetable pandal is suitable to them looking at their land holding and quality of the land. The agro-horticulture is suitable to the fallow land and marginal lands and helped them to restore and cultivate them	10
Alignment with the local food and market demand	Market for fruit and vegetable is available locally and beneficiary is not finding any difficulty in selling it	9.8

Acceptance of Organic cultivation	As per the beneficiary the vermicompost and Panchakavya is beneficial and they have skill and all the ingredients with them, hence they continue to use them in farming	9.8
Inclusiveness of women in home gardens	All the home garden is maintained by the women member of the family, the women participation in the activity is quite good.	10
Consistency with the State program and CSR Objectives	Tamil Nadu State Organic Farming Policy, the National Mission on Sustainable Agriculture, the Horticulture Department's home garden and nutrition garden schemes, and watershed-linked livelihood programmes has been promoting these activities. It aligns with CSR objectives and targets in environmental sustainability, ecological balance, conservation of natural resources, rural development, and the promotion of sustainable livelihoods, nutrition, and food security.	10
Average		**9.9**

2.2.4 Orientation and agri-tech training, Exposure visits, skill development and field demonstration

Through an organised program of orientation, agri-tech training, exposure visits, and field demonstrations, the awareness, capacity-building, and skill-development programs increase farmers' knowledge, skills, and adaptive capacities. These initiatives' main goals have been to close knowledge gaps, encourage the adoption of better agricultural techniques, and increase farm productivity and livelihoods, especially in project areas with limited resources.

To acquaint farmers, community organisations, and local stakeholders with project goals, sustainable agriculture principles, and available technical assistance, orientation programs were arranged. These one-day workshops promoted involvement, raised awareness, and matched solutions to regional needs. To help farmers make well-informed agronomic decisions, agri-tech training sessions were held on topics that support sustainable agriculture and livelihood development, such as improved crop practices, soil and water management, organic and natural farming inputs, integrated pest and nutrient management, and efficient resource use.

The beneficiaries were able to witness best practices and cutting-edge technologies in authentic environments through exposure tours of successful farms, model towns, and research or training facilities. These visits encouraged farmers to reproduce successful models in their own fields, increased confidence, and promoted peer learning. By converting theoretical knowledge into practical application, skill development programs and practical field demonstrations further reinforced learning. These activities covered topics directly relevant to modern and organic cultivation, livestock management, plantation and enhanced crop layouts, etc.

Orientation training

The purpose of the one-day orientation training is to transmit technology in the field and raise awareness among the village development committee. During the evaluation period, eight orientation training sessions were conducted in the Beemandapalli and Thazhaiyuthu clusters. These programs addressed a number of important themes, including an explanation of the agricultural component and the project's general features, with a focus on its objective and anticipated consequences. The training also featured information exchange regarding traditional seed types and value addition, reports on agricultural activities and plans for the next year in the villages, and discussions on the impact of field demonstrations. With 41% and 33% gender engagement, respectively, the initiative benefited 157 individuals in the Beemandpalli cluster and 61 in the Thazhaiyuthy cluster. Details about the orientation training program are given in the following tables.

Table 2.26: Orientation training program conducted, Beemandpalli cluster, Krishnagiri dist.

Financial year	Number of Programs	Villages covered	Total Number beneficiaries	Gender%	Cost
2024-2025	5	Beemandapalli, Oddur, Puliyacheri	157	41	50000

Table 2.26a: Orientation training program conducted, Thazhaiyuthu cluster, Tiruvannamalai dist.

Financial year	Number of Program	Villages covered	Number beneficiaries	Gender %	Cost
2024-2025	3	Thazhaiyuthu, Arattavadi, Porasapattu	61	33	3000 00

Agri-tech training

The One-day agri-technology training was organised for the beneficiaries with the objective of creating awareness of available technologies, the benefits of adaptation, and the transfer of Technology to improve cultivation and climate-resilient cropping in the project villages. The various topics include supporting organic cultivation, livelihood generation from agricultural activities, soil health, and wild boar control. The following tables provide details on the 45 training programs organised during the assessment period in both clusters.

Table 2.27: Agri-technology training program, Beemandpalli cluster, Krishnagiri Dist. year 2024-2025

Training	Villages covered	Number of beneficiaries	Gender%	Cost
Bee keeping	Beemandapalli, Puliyancheri	31	22	15000
Mushroom cultivation	Beemandapalli, Puliyancheri	43	30	15000
Sericulture	Beemandapalli, Puliyancheri,Oddur	22	0	15000
Poultry farming (Indigenous Species)	Beemnadapalli, Gollapalli, Puliyancheri	22	46	15000
Rabbit farming	Beemandapalli, Puliyancheri, Oddur	25	32	15000
Agri-exhibition	Beemandapalli, OddurPuliyancheri	35	57	15000
Organic farming	Beemandapalli, Puliyancheri	21	0	15000
Vermicompost and azolla	Beemandapalli, Puliyancheri	33	21	15000
Wild life control (Wild pig)	Beemandapalli, Puliyanchersi	25	16	15000
Inter cropping	Puliyancheri, Beemanadapalli, Oddur	25	16	15000
Soil testing	Puliyancheri, Beemandapalli, Gollapalli, Oddur	33	30	15000
Home garden	Oddur	22	77	15000
Micro-nutrient	Oddur, Puliyancheri, Gollapalli, Beemnadapalli	15	0	15000
Nursery raising	Puliyancheri, Oddur, Beemandapalli	28	25	15000
Org Farming	Beemandapalli, Puliyancheri	20	30	15000
Plantation	Puliyancheri, Beemandapalli, Oddur	23	0	15000
Agr-Horti (MangoPaddy)	Puliyancheri, Beemandapalli	21	9	15000

Crop diversification (Exposure)	Beemandapalli, Puliyancheri, Oddur	24	0	15000
Fish farming	Puliyancheri, Oddur, Beemandapalli	27	23	15000
19		**495**	**23**	**285000**

Table 2.27a: Agri-technology training program Thazhaiyuthu cluster in Tiruvannamalai dist. year 2024-2025

Training	Villages covered	Number of beneficiaries	Gender%	Cost
Azolla unit Training	Thazhaiyuthu, Porasupattu, Arattavadi	25	100	15000
Fish farming	Thazhaiyuthu, Porasupattu, Arattavadi	24	38	15000
INM & IPM for crops	Thazhaiyuthu, Porasupattu, Arattavadi	43	23	15000
Vermicompost Training	Thazhaiyuthu, Porasupattu, Arattavadi	29	21	15000
Mushroom Cultivation	Thazhaiyuthu, Porasupattu, Arattavadi	36	25	15000
Live stock	Thazhaiyuthu	40	43	15000
Panchakavya & Jeevamirtham	Porasupattu	52	44	15000
Fodder Development	Thazhaiyuthu, Porasupattu, Arattavadi	22	55	15000
Honey Bee training	Arattavadi	14	21	15000
Mushroom Cultivation	Arattavadi	26	42	15000
Sericulture	Thazhaiyuthu	20	90	15000
Chicken farm	Thazhaiyuthu, Porasupattu, Arattavadi	24	67	15000
Rabbit Farming	Thazhaiyuthu, Porasupattu, Arattavadi	23	57	15000
Agricultural Exhibition	Thazhaiyuthu	28	21	15000
Organic Farming	Thazhaiyuthu, Porasupattu, Arattavadi	12	8	15000
Vermicompost &Azolla	Porasupattu, Arattavadi	19	47	15000
Wild Boar	Porasupattu, Thazhaiyuthu	24	8	15000
Intercropping	Thazhaiyuthu, Porasupattu, Arattavadi	19	47	15000
Homegarden kits distribution	Thazhaiyuthu	21	57	15000
Nursery Development	Thazhaiyuthu, Porasupattu, Arattavadi	20	45	15000
Organic Formulation Preparation	Thazhaiyuthu, Porasupattu	43	56	15000
Soil Sample Test Report Explanation	Thazhaiyuthu, Porasupattu, Arattavadi	20	10	15000
Fish Farming	Porasupattu, Arattavadi	29	59	15000

Goat Farming	Thazhaiyuthu, Porasupattu, Arattavadi	20	25	15000
Formation of FPO & Beneficiaries	Thazhaiyuthu, Porasupattu	24	83	15000
Millets Value Addition	Porasupettu, Thazhaiyuthu	23	52	15000
26		680	44	390000

Success Story: Annammal – Building a Sustainable Livelihood through Sericulture

Annammal, a 50-year-old resident of Thazhaiyuthu village, has successfully diversified and strengthened her livelihood through sericulture, supported indirectly by Titan CSR interventions implemented by the National Agro Foundation (NAF).

Annammal was earlier associated with a Self-Help Group (SHG) supported under Titan CSR's NAF implementation framework, through which she had accessed a loan. As part of capacitybuilding efforts, NAF organised exposure and training programmes in 2022 and 2023. During these programmes, Annammal was introduced to sericulture practices, which sparked her interest in adopting the activity as an additional income source.

Motivated by the training exposure, she proactively approached the local Sericulture Department and availed benefits under a government subsidy scheme. The total investment for setting up the sericulture unit amounted to ₹10 lakh, of which ₹6 lakh was contributed by Annammal and ₹4 lakh was received as subsidy. The subsidy package included support for cocoons. A dedicated sericulture shed measuring 75 feet in length and 25 feet in breadth was constructed on previously unused land, ensuring no diversion of cultivable agricultural area.

Annammal cultivates mulberry on two acres of land, which serves as the primary feed source. The shed has a capacity of 200 bags of silkworms; however, she currently limits operations to around 120 due to constraints on mulberry leaf availability. The silkworms are procured from Tiruppur at an approximate cost of ₹5,000 per batch (excluding transportation). She began full-scale sericulture operations in 2024 and now undertakes three cycles annually, with each cycle generating an average net profit of ₹20,000.

In addition to sericulture, Annammal's agricultural livelihood has significantly improved due to NAF's channel clearance activities under the Titan CSR programme. Improved water availability has enabled her to shift from a single paddy crop annually to three harvests per year, substantially enhancing household income stability.

Sericulture management requires relatively low daily time investment. Annammal spends approximately one hour per day on feeding activities, increasing to two to three hours during the final three days of the 15-day silkworm rearing cycle for close monitoring and preparation for harvesting. She reports high satisfaction with her decision and expresses confidence in managing the enterprise independently. While she does not currently require additional training, she remains open to adopting new techniques and regularly consults NAF and the local Sericulture Department for technical guidance.

Annammal's experience highlights how targeted capacity-building, alignment with government schemes, and complementary infrastructure support can enable rural women to adopt high-value livelihood activities, optimise land use, and build resilient, diversified income systems.

Exposure visits

The objectives of this activity were to get knowledge sharing, exposure, sensitisation/introduction to new technology, etc. The SHG & ADC members have provided an opportunity to interact with the experts and understand the various developments in the agriculture sector. During the assessment period, the project beneficiaries made a 2-3 day visit to KVKs, FPOs, technical institutions, universities, businesses, agro-tourism agencies, Agro Foundation, etc. A total of 9 visits (5 in the Beemandapalli cluster and 4 in the Thazhaiyuthu cluster) with 160 members were successfully conducted by the agency during the assessment period. Details on the visits are given in the following tables.

Beneficiaries interacted with him and acknowledged the visits that have motivated him to adopt modern, environmentally friendly techniques in farming and livestock management. The visit has given them new ideas for expanding their livelihood activities in the coming years.

Table 2.28: Exposure visits, Beemandapalli cluster, Krishnagiri dist. Year 2024-2025

Places/ Organization	Villages covered	Beneficiaries (No)	Gender%	Cost
Santhiyur KVK, Mecheri FPO	Kuppachiparai, Puliyancheri., Golapalli, Beemandapalli, Oddur	24	17	75000
MABIF Madurai	Beemandapalli, Puliyancheri, Oddur	22	18	75000
KVK, Thiruppur	Beemandapalli, Puliyancheri, Oddur	20	14	75000
CFRD ILEDU	Beemandapalli, Puliyancheri	15	20	75000
TANUVAS	Beemandapalli, Oddur, Puliyancheri, Golapalli	22	40	75000
Total 4 visits		79		300000

Table 2.28a: Exposure visits, Thazhaiyuthu cluster, Tiruannamalai dist. Year 2024-2025

Places/ Organisation	Villages covered	Beneficiaries (No)	Gender%	Cost
NABARD,MAdhurai(Bagri Business Development),Agro Tourism	Thazhaiyuthu, Arattavadi	23	44	75000
KVK (sandhiyur),Araikkal FPO,Research Institute,Nammakkal	Thazhaiyuthu, Arattavadi, Porasapattu	23	35	75000
KVK(Thiruppur),Organic Farming,Moringa Processing unit	Thazhaiyuthu, Arattavadi	19	47	75000
National Agro Foundation(CFRD) FPO Brefiely explained,FLD,Moringa business	Thazhaiyuthu, Arattavadi	16	31	75000
Total 4 visits		81		

Animal Health camp

The aim of organising animal and livestock health camps is to provide the community with access to various government facilities. The camps organised during the assessment period have certainly improved cattle health and raised awareness of balanced diets and the importance of injection/vaccination in maintaining animal health. During the assessment period, 6 camps, 2 in the Beemandpalli cluster and 4 in the Thazhaiyuthu cluster, were held, and 217 beneficiaries benefited. During the camp, animals were vaccinated, and medication was administered to the ailing animals. Beneficiaries received free of cost vaccine & deworming, artificial insemination, basic medicines & health supplements to their animals and poultry birds and advice and guidance from the doctors in identifying the disease based on symptoms for sustainable livestock management. The beneficiary acknowledged that earlier they were travelling miles to get treatment for the ailing animals; now they get it in the villages themselves and have the opportunity to learn to take care of their animals by early detection of possible ailments and primary treatment. The following tables provide details on the activity and beneficiaries.

Table 2.29: Animal health camp, Beemandapalli cluster, Krishnagiri Dist. Year 2024-2025

Village covered	Number of camps	Beneficiaries (No.)	Female %	Livestock addressed	Cost

				Milch animal	Goat	Poultry	
Beemandapalli	2	45	31	202	54	103	40000

Table 2.29a: Animal health camp, Thazhaiyuthu cluster, Tiruvannamalai Dist. Year 20242025

Village covered	Number of camps	Beneficiaries (No.)	Female %	Livestock addressed			Av, Cost
				Cow	Goat	Buffalo	
(Thazhaiyuthu) Poyampalli	1	34	26	327	166	1	20000
(Thazhaiyuthu) Karadikuthu	1	20	20	127	140	26	20000
Thazhaiyuthu	1	68	22	476	33	37	20000
Porasapattu	1	50	26	231	135		20000

Field Demonstration

Field demonstration is an important component in sustainable climate-resilient agriculture.
Because existing cultivation is no longer possible due to high input costs and limited water resources and soil fertility. It was an opportunity for them to learn and adopt technical skills. During the assessment period, one field demonstration was organised, attended by 15 farmers who learned modern, efficient paddy and tomato cultivation. The real impact can only be documented when these beneficiaries adopt the learnings. The Thazhaiyuthu beneficiary acknowledged that the proposed paddy cultivation is beneficial due to the high-yielding variety and the suggested technologies for sowing, fertiliser application, and weed management. The following table provide details on the activity in the project clusters.

Table 2.30: Field demonstration, Beemandpalli cluster, Krishnagiri dist., 2024-2025

Villages covered Beneficiaries	Beneficiaries	Gender %	Crops	No. of demo	Cost
Oddur, Puliyancheri, Beemandapalli, Golapalli	15	13	Paddy, Tomato	10	120000

Table 2.30a: Field demonstration, Thazhaiyuthu cluster, Tiruvannamalai dist., 2023-2024

Villages covered Beneficiaries	Beneficiaries	Gender %	Crops	No. of demo	Cost
Thazhaiyuthu, Porasapattu, Arattavadi	30	0	Paddy, Bendi	10	120000

Two more field demonstration and skill development programs were held during 2023-2024 in the Beemandapalli cluster. This demonstration program was to provide hands-on practice on beekeeping and the use of solar traps. Beneficiaries have acknowledged the skill helps expand their livelihood base.

Table 2.31: Bee keeping (Apiculture) training and demonstration, Beemandpalli cluster, Krishnagiri dist., 2023-2024

Villages covered	Number beneficiaries	Male%	Training cost (Av)	Total cost

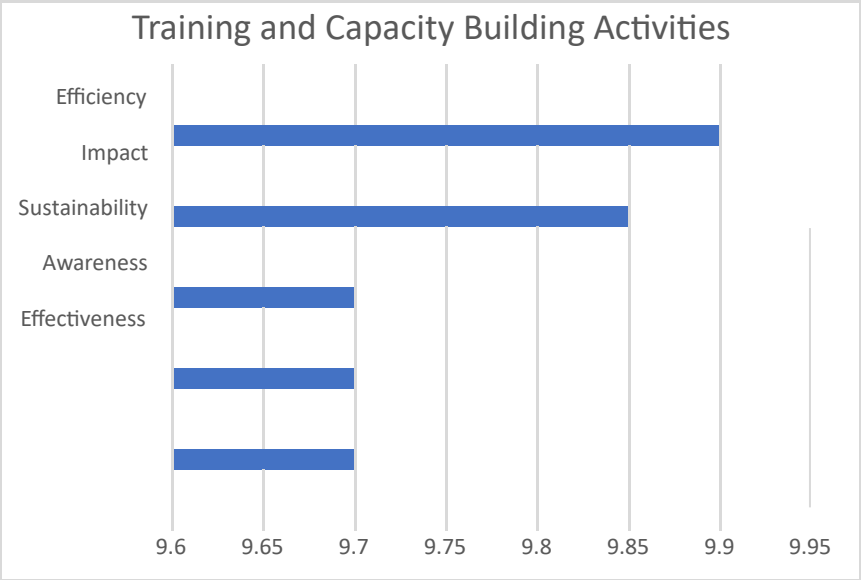
Beemandapalli, Oddur and Puliyancheri	5	100	2000	10000

Table 2.32: Solar trap demonstration, Beemandpalli cluster, Krishnagiri dist., 2023-2024

Villages covered	Number of beneficiaries	Gender%	Program	Cost
Golapalli, Beemandapalli, Puliyancheri	15	27	1	37500

2.2.4.1 Evaluation of training and capacity development activities based on the EASIER Framework

The EASIER score for the component is 9.78.



The following are the details of the framework:

Effectiveness		
Indicators	Details	Score
Types of programs	Orientation program, Agri-tech program, Exposure visit, Bee keeping, Animal health camp, Field Demonstration are regularly held in the project villages	10
Number of programs	Since the onset of the program the agency organised more than 30 orientation programs, 70 agri-tech, more than 15 exposure visits, several field demonstrations, 19 animal health camp, bee keeping, solar trap, etc.	10
Average number of attendees and gender participation	More than 700 participated in orientation programs, more than 1700 in agri-tech programs, more than 800 in animal health camp, more than 300 in exposure visits and 60 in the field demonstration and 5 in bee keeping programs with average gender participation of more 33%	10

Improvement in the knowledge and skills	As per the respondents they have learnt and sensitised towards several livelihood, cultivation and animal care, etc due to the training and skill development programs. The exposure visits given them enough confidence to initiate and diversify their livelihood and cultivation practices	9.5
Adoption of modern agriculture and livestock practices	The SRI, inter cropping, agro-horticulture and organic cultivation, drip irrigation area few adopted cultivation practices. The artificial insemination, regular vaccination and livestock supplements like mineral mix are benefitting them a lot	9.5
Effectiveness of field demonstration	The field demonstration on the modern and climate resilient cultivation found to be effective. The organic cultivation is gradual finding interest among the farmers	9.5
Upscaling the livelihood activities	The sericulture, honey bee keeping, inter cropping, vegetable pandals, tree based and livestock related livelihood activities found to be profitable.	9.4
Average		**9.7**
Awareness		
Awareness level of improved agritechnology and good practices	Farmers are implementing the knowledge and skill developed from the capacity building programs and exposure visits. The agroforestry, SRI, organic cultivation found to be successful in the villages	9.6
Awareness of animal health and disease prevention	Through the regular health camp and interactions with veterinarians and para-veterinary staff, livestock owners have gained practical knowledge of common diseases, symptoms, and timely preventive measures such as vaccination, deworming, and mineral supplementation. The camps have improved awareness on hygienic housing, balanced feeding, and early reporting of illness, reducing reliance on traditional trial-and-error treatments	10
Awareness of government schemes, extension services	Through trainings, exposure visits, and interactions during project activities, beneficiaries have become more informed about schemes related to animal husbandry, fodder development, insurance, subsidies, and credit support. These activities strengthened linkages with line departments such as Animal Husbandry, Agriculture, and Rural Development, improving access to veterinary services, extension advice, and institutional support, which is important to continue it beyond the project period.	9.6
Awareness and skill on climate resilient practices	Through practical demonstrations and peer learning, farmers have gained knowledge on adaptive technologies such as beekeeping for income diversification, solar traps for eco-friendly pest management, and improved crop and water management practices suited to changing climatic conditions. Exposure visits have helped beneficiaries understand successful climate-resilient models and replicate them locally.	9.5
Awareness on the record keeping and upscaling of the activities	From the beneficiary and SHG FGD, it has come to light that SHGs are well aware of and skilled in record keeping and in upscaling livelihood activities by extending loans to other than cattle and goat rearing. They have extended loans to members for tiffin services, which have been found to be beneficial. Based on this the SHGs are now looking forward to extend loans to more such activities which will diversify and enhance the income generation activities among the rural poor women	10

Average		**9.74**

Sustainability		
Continued of livelihood promotion and best farming practices	There are more than 200 milk cattle, more than 50 backyard poultry, and 44 goat-rearing beneficiaries, who have increased their livestock numbers and are looking forward to further expanding the activities. Besides the beneficiaries the fellow villagers have also procured milk cattle and goats to improve their household income. These activities going to further enhanced due to increased agriculture and fodder availability in the villages	9.7
Self -reliant farmers to initiate new ventures	The skill and exposure and linking with financial institutions provided them new ideas and avenue to invest and expand livelihood basis. Examples like sericulture, bee keeping, etc have been reported and visited during the field work	9.6
Locally trained trainers available	The VDC and SHG members are skilled due to participation in the capacity development and exposure visits. They have the capacity to train others.	9.5
Institutionalizing capacity building	The regular trainings can be institutionalised by linking the panchayat with the KVKs and Agriculture University and other Institutions who are in collaboration with the government capacity building programs	9.4
Behavioural change that influencing the farming and livestock management	The project interventions have led to visible behavioural changes influencing both farming and livestock management practices. Farmers have increasingly shifted from reactive to preventive approaches, adopting practices such as timely vaccination, deworming, balanced feeding, and mineral supplementation. There is greater emphasis on soil and moisture conservation, the use of organic inputs, crop diversification, and climate-resilient practices, rather than on monocropping and chemical inputs.	10
Regular health check and vaccination and insemination	The 19 health camps in the project villages and exposure visits have sensitized the farmers towards the improving access to veterinary services, extension advice, and institutional support. This will be available beyond the project period	10
Average		**9.7**

Impact

Knowledge, practices, livelihoods, and resilience of beneficiaries.	It is evident from the improved crop production techniques, soil and moisture conservation, climate-resilient practices, and scientific livestock management in the project villages. The interaction has narrated increased awareness of balanced feeding, disease prevention, organic inputs, pest management tools such as solar traps, and diversified livelihood options	9.8
Increased adoption of improved agricultural, livestock, and climate-resilient practices	Changes in practices are reflected in the increased adoption of recommended agricultural and livestock management practices. Farmers have begun applying techniques demonstrated during field trainings, such as use of organic inputs, crop diversification, fodder cultivation on bunds, preventive animal healthcare, and timely vaccination and deworming. Animal health camps have contributed to a shift from curative to preventive health management, leading to improved housing and feeding practices, and to earlier reporting of animal diseases.	9.8
Enhanced confidence and decision-making capacity in farming and enterprise management	They are now capable in making choices related to crop selection, input use, livestock management, and market engagement. It is evident from the cropping pattern, species selection in agrohorticulture and agro-forestry, field bund creation and drip irrigation are a few examples to quote	9.8
Reduced disease incidence and mortality rates	It has been reported that the disease and mortality rate is very low since they are participating in the animal camps and orientation training programs.	10
Participation of women and marginal farmers in economic activities	SHGs members are mostly from marginal and weaker section of the society. They have initiated economic activities by adopting dairy, goat rearing, backyard poultry, and vegetable cultivation, which are helping them improve their economy.	10
Average		**9.88**
Efficiency		
Cost per program and on trainees	The average cost on the program and participants was well within the allocated fund. Rs. 10000 per orientation program that comes to an average Rs. 300 per participants, similarly agri-tech Rs.550/ participants, 588/ per beneficiary of animal health camp, and Rs. 1980/ per participants on exposure visits, and Rs. 15000 per field demonstration program, Rs. 2000 per beneficiary on Bee keeping skill program, etc.	10
Participation in animal health camp	More than 700 took part in the animal health cam in which more 33% was the women participants.	10
Experts and delivery mechanism of capacity building program	The program was handled by subject matter specialists who have long and similar experience. The agency involved technical institutions like KVK, Agriculture university faculty and technical experts to create awareness and technical skill among the farmers	10
Use of training skill and field demonstration	It is evident in the field due to the beneficiary's organic cultivation, agroforestry and horticulture, SRI, honeykeeping, and sustainable livestock practices.	9.5
Convergence opportunities with government programs	There are convergence opportunities, in the National Mission on Sustainable Agriculture, Tamil Nadu State Rural Livelihood Mission, National Livestock Mission, and ongoing watershed and climate-resilient agriculture programmes	10
Average		**9.9**

2.2.5 Livelihood supports

Under the project aimed at enhancing rural women's livelihoods, the implementing agency mobilized and motivated women to form Self-Help Groups (SHGs) and undertake income-generating activities. As a result, 113 SHGs are currently active across the project clusters. These SHGs were supported with Revolving Fund Assistance (RFA) to initiate and scale up economic activities.

The SHGs have primarily used the RFA to purchase milch cattle, goats, and poultry chicks. Financial support of ₹50,000 was provided for the purchase of milch cattle and ₹20,000 for goat rearing. The repayment structure for cattle loans was fixed at 20 instalments at an interest rate of 12%, while goat loans were to be repaid in 10 instalments at the same rate. In addition, backyard poultry activities were promoted under the project to supplement women's incomes.

During the assessment year, loans were extended only for the purchase of milch cattle in both clusters. However, goat rearing and backyard poultry are widely perceived by the community as promising livelihood options for income generation. To further enhance productivity, mineral mixture was recently distributed to selected beneficiaries to improve milk yield.

Beyond individual livelihoods, the SHGs have also undertaken community-level investments using the interest earned from SHG lending. In Attarawadi village, a paddy threshing yard was established at a total cost of ₹3 lakh, funded by interest income generated by the SHGs. Similarly, in Thazhaiyuthu village, a 15 m × 15 m threshing yard was constructed utilizing SHG interest earnings. These need-based investments reflect strong collective decision-making by the SHGs, and the villagers have expressed interest in further strengthening these facilities by adding equipment such as a drum shredder.

Milk dairy

The SHGs of Beemanadapalli extended loans to 19 members for the purchase of milch cows, totalling ₹9,50,000, whereas the SHGs of the Thazhaiyuthu cluster extended loans to 16 members totalling ₹8 lakh. It is encouraging to note that members' loan repayments have been regular, and the SHGs have been able to mobilise substantial savings. As a result, a larger number of members have been supported with loans to procure milch cows and initiate their livelihoods.

The cows (cattle) yield about 12–14 litres of milk per day for about 8–10 months of the year. The milk is sold at ₹35 per litre. Based on interactions with SHG members, it can be concluded that dairy farming has emerged as a viable and improved livelihood opportunity for women in the project areas at the rate of 35-40%. This activity received well due to the milk collection center in the village and all the milk produced are sold in the village itself. Further, this initiative primarily targets landless women, enabling them to take charge of their economic futures and highlighting the importance of inclusive economic activities in enhancing the livelihoods of vulnerable groups.

Approximately 60% of the women beneficiaries reported earning around ₹5,000 per month, while the remaining beneficiaries earn between ₹3,000 and ₹4,000 per month. As reported by the beneficiaries, about 2 litres of milk per day is retained for household consumption, which is essential for child nutrition. Until the loan is fully repaid, more than 90% of the income is spent on loan repayment and the purchase of cattle feed.

The savings generated have been used to pay children's school fees, meet cultivation expenses, and address other household requirements. Beneficiaries also acknowledged that fodder support provided under the project has helped reduce expenditure on purchased cattle feed at the rate of 30-40% of the total input cost In addition, they highlighted the use of cow dung for compost preparation and Panchakavya, which provides an added benefit of household-level dairy farming.

Table 2.33: Milch cow purchase under the SHG program, Beemandpalli cluster, Krishnagiri, Financial year 2024-2025

Name of the village	Beneficiaries	RFA amount
Gollapalli	5	250000
Oddur	4	200000
Paraiyur	4	200000
Puliyancheri	6	300000
Total	19	950000

Table 2.33a: Milk cattle, Goetery and other activities, Thazhaiyuthu cluster, Tiruvannamalai District, year 2024-2025.

Total Beneficiary	Cattle@50000	Goat@20000	Total (Rs.)	Goat (Rs)	Cattle (Rs)	Tiffin shop
16	16	0	800000	0	800000	

Goatery (goat rearing)

Goat rearing is considered a more profitable and reliable livelihood option compared to dryland cultivation, particularly for marginal and small landholding households. Although no new loans were extended during the assessment year, beneficiaries increased their goat population through savings generated by the activity itself. The initiative has been well received by the community, supported by strong local demand for goats and related products.

Based on the assessment, it can be concluded that the goat-rearing initiative, supported through a revolving fund mechanism, has significantly enhanced household incomes among poor households in the project villages. Nearly 60% of respondents reported annual incomes of approximately ₹45,000 from goat rearing, while the remaining beneficiaries reported incomes in a comparable range. Beneficiaries expressed a positive perception of the activity, stating that it contributes substantially to their household income and financial stability.

In terms of productivity, about 50–60% of respondents reported that each goat produced three kids, while the remaining respondents reported four kids per goat. This level of productivity indicates strong potential for herd expansion, sustained income generation, and improved long-term food security for the community.

House yard poultry

Backyard poultry farming was promoted as a targeted livelihood intervention for the most vulnerable groups in the villages, including widows, landless women, and single-parent households, with priority given to widows. The initiative aimed to enhance household nutrition while creating a sustainable micro-livelihood opportunity for rural poor women.

Under this activity, each beneficiary was provided with 20 one-month-old poultry chicks along with a specially designed 5 ft × 5 ft poultry shed, at a total cost of ₹20,000 per beneficiary. The poultry variety supplied yields approximately 280–310 eggs per bird per year. All beneficiaries reported that their household requirements for eggs and meat were fully met, enabling families to provide a healthy and balanced diet for their children through home-produced eggs and meat. This has significantly reduced dependence on purchased food while improving household nutrition.

In addition to meeting nutritional needs, several beneficiaries have transformed backyard poultry into a small income-generating activity by selling surplus eggs and meat within the village. One beneficiary reported collecting around 90 eggs per bird over the past six months. After meeting household consumption needs, she sold the remaining eggs to neighbours and local shops, earning approximately ₹1,200 per month.

There is growing interest among beneficiaries in scaling up this activity by increasing the number of chicks. The poultry breed promoted (BV-380) demonstrates strong potential, with a productive lifespan of up to three years and the capacity to yield nearly 300 eggs per year. The initial establishment cost per unit is approximately ₹16,000, and

the innovative cage design provides enhanced protection against external threats, thereby improving the activity's resilience and sustainability.

Mineral mix

To improve livestock health and productivity, 160 beneficiary cattle rearing in the Beemandpalli cluster received a 1-kilogram box of a mineral combination for Rs. 200.00 as part of the CSR initiative. The goal of the intervention was to address the mineral deficiencies frequently observed in milch animals, especially in dry and semi-arid areas. These deficiencies frequently lead to poor animal health and reduced milk output.

After using the mineral mix on a regular basis, beneficiaries reported noticeable improvements in milk yield, animal health, and reproductive function. Additionally, the supplements improved feed efficiency and decreased the prevalence of health problems. In addition to improving livestock care and nutrition, this assistance has helped increase household income from dairy operations. All things considered, the mineral mix intervention has shown to be an economical and significant input for bolstering dairy-based livelihoods under the CSR project.

Table 2.34: Mineral mix made available in Beemandpalli cluster, Krishnagiri Dist.

Villages covered	Beneficiaries (No.)	Gender	Quantity (Kg)	Av cost/ kg	Total cost
Beemandapalli, Puliyancheri, Oddur, Gollapalli	160	38	162	200	32400

2.2.4.1 Respondents' response to the SHG based livelihood and related capacity building

Respondents reported actively participating and benefiting from poultry, goat, and cattle rearing. They also reported receiving quality training in livestock management. They reported that milk production from cattle increased by 67 and 133 per cent over the years. The goat and poultry bird growth has registered substantially. They also reported receiving vaccination and breed improvement support at 49 and 53 per cent, and 21 and 23 per cent, respectively. A few respondents have also reported that they received support to renovate their cattle shed. 49 and 33 per cent of respondents reported participating in the veterinary camp and benefiting. They reported that they got the free artificial insemination services for their cattle during the cattle camps. They reported that milk yield has increased, animal health has improved, and access to veterinary services is very high. They reported an increase in their income, nutrition, and child education due to livestockrelated activities and support. They endorse that the savings and internal lending are going hand in hand. The training and capacity-building programs have greatly benefited the SHGs in their functioning. Average lending ranges from 20,000 to 50,000, with an annual interest rate of 12% and a repayment period of 20 instalments. They reported that the SHGs are only 4-6 years old and have been performing well since their formation. The average number of members in the SHGs ranges from 14 to 18. The SHG president maintains the documents. They responded that SHG activities have increased their self-confidence, financial independence, regular income, access to loans, banking, and the health of their cattle and livestock.

Table 2.35: Respondents' response to the Livelihood programs

District	Village Name	Livestock Type	Increase in Cattle (%)	Increase in Goats (%)	Increase in Poultry Birds (%)	Livestock-related Training (%)	Vaccination Support (%)	Breed Improvement (%)	Shed Renovation (%)	Fodder Raising Support (%)	Veteri-nary Camp (%)
Krishnagiri	Bhimandapalli	Poultry, Milk Cattle	50	0	300	63	63	13	25	63	63
	Puliyancheri	Cattle, Poultry	100	0	0	33	33	0	0	33	33
	Gollapalli / Oddur	Cattle	50	0	0	50	50	50	0	50	50
	Average	—	**66.67**	**0**	**100**	**48.67**	**48.67**	**21**	**8.33**	**48.67**	**48.67**
Tiruvannamalai	Arattavadi	Cattle	0	0	0	33	33	33	0	100	100
	Porasapattu	Cattle	200	400	0	100	100	50	0	25	0
	Thazhaiyuthu	Cattle, Goatery, Poultry	200	0	0	25	25	0	0	0	0
		Average	—	**133.33**							

Table 2.35a: Respondents' response to the Livelihood programs- contd

District	Village Name	Livestock insurance	Cattleshed renovated	Av. milk yield increase	Improvement in animal health	Ease of access to veterinary service	Artificial inseminati on service used	Improved breed introduction	Benefits
Krishnagiri	Bhimandapalli	25	25	155	High	Very high	75	75	Income, nutrition
	Puliyacheri	33	33	100	High	Very high	33	33	Income, nutrition, child education
	Gollapalli/Oddur	50	50	150	High	Very high	50	50	Income, nutrition, child education
	Average	36	36	135	High	Very high	52.67	52.67	
Tiruvannamalai	Arattavadi	0	33	0	High	Very high	33	33	Income, Nutrition
	Porasapattu	50	100	12.5	High	VH	100	100	Income, Nutrition
	Thazhaiyuthu	0	25	Can't say	High	VH	25	25	Income, Nutrition
Average		**16.67**	**52.67**				**52.67**	**52.67**	

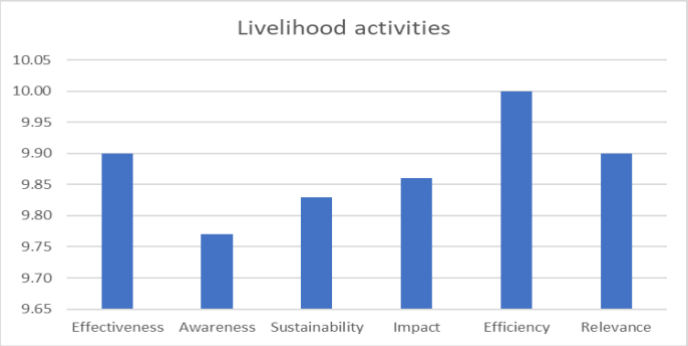
Table 2.36: Respondents response to the SHGs and benefits

District	Village Name	SHGs	Years of existence	Av.membes	Saving internal lending repayment	Capacity building	Ave lending (Rs.)	Rate of Interest (%)	Repayment	Ease of access to loan	Responsibility of record keeping	Describe how SHG participation improved household or women's empowerment
Krishnagiri	Bhimandapalli	Active	4	15-20	63	50	200-5000	12	20		President	Self-confidence, Financial independency, regular income, easy loan, banking, cattle and livestock health
	Puliyacheri	Active	6	20	33	33	200-5000	12	20	Very high	President	Self-confidence, Financial independency, regular income, easy loan, banking, cattle and livestock health
	Gollapalli/Oddur	Active	6	20	50	50	200 - 5000	12	20	Very high	President	Self-confidence, Financial independency, regular income, easy loan, banking, cattle and livestock health
Average			**5.33**	**18**	**48.67**	**44.3 3**			**20.0 0**			
Tiruvanamalai	Arattavad	Active	5	13	25	0	200 - 5000	12	20	Very high	President	Self-confidence, Financial independency, regular income, easy loan, banking, cattle and livestock health
	Porasapattu	Active	4	14	50	50	200-5000	12	20	Very high	President	Self-confidence, Financial independency, regular income, easy loan, banking, cattle and livestock health
	Thazhaiyuthu	Active	4	14	33	25	200-5000	12	20	Very high	President	Self-confidence, Financial independency, regular income, easy loan, banking, cattle and livestock health
Average			**4.33**	**13.67**	**36**	**25.0 0**		**120**				

2.2.5.2 Evaluation of Livelihood Supports Based on EASIER Framework

The overall score of the component is 9.88.

EASIER	Score
Effectiveness	9.90
Awareness	9.77
Sustainability	9.83
Impact	9.86
Efficiency	10.00
Relevance	9.90
Average	**9.88**



The following are the details of the framework and performance

Effectiveness		
Indicators	Details	Score
Number of active SHGs utilizing revolving fund	More than 100 SHGs provided initial revolving fund to initiate household dairy and goetery. There are 206 SHG members received loan to purchase cattle and 44 received for Goat.	9.8
Savings made by the SHGs	Average Rs. 2.5 lakhs, from the savings they established threshing yard to ease the farming activity	10
Timely disbursement and repayment	The RFA was made available in the beginning of the project. The SHGs are active and take minimum time to process and release the loan amount in time so that the beneficiary can start the livelihood activity at the earliest	10
Adoption rate of improved dairy, goetery and house yard poultry	The beneficiary reported that from the savings they have expanded the activity by way of purchasing more livestock	9.7
Improved milk production and market	On an average 12-14 liter milk per cattle and 3-4 goat in a year and average 280 no. eggs per year per hen is reported. All these produces are sold and consumed locally.	10
Average		**9.9**
Awareness		
Awareness on the SHG finance and lending norms	As per the primary survey, the SHG records are maintained properly and responsibility lies with the president. The norms are 20 instalment is fixed for cattle loan and 10 instalments for goat lending. All the SHG members are aware of norms and performance of respective SHGs	10
Awareness on the dairy, goat and poultry best practices	Women participants of the orientation and agri-tech training and animal health camp provided sufficient exposure and skill to manage and earn livelihood	9.6
Awareness on the health and feed practices of livestock	During the health camp cattle and goat rearing beneficiaries given training and skill to observe the symptoms and necessary medication to address the diseases.	9.8

Awareness of government livestock caring facilities and feeding	Villagers are provided and oriented during the orientation training towards the animal health care and also facilities available in the State. Because in Tamil Nadi, veterinary care is provided through a wide network of Veterinary Dispensaries, Veterinary Sub-Centres, and Mobile Veterinary Units. However, regular health camp was organised in the project villages	9.6
Awareness about the market for the produces	Milk collection centres are available in the villages and they are taking milk produced into it and sold for Rs. 35 per litre. Regarding other produces like egg and meet, there is sufficient market due to closure urban settlement like Krishnagiri, Tiruvannamalai and Chengam.	10
Awareness about the value addition and market chain opportunities	As result of Agri-tech training and skill based training a few initiatives have taken to add value to animal excreta and food waste. During the visit come across such value addition practices like preparation of amino acid from fruit waste, fish waste and value addition to vegetables, leaves and spices using the solar driers.	9.6
Average		**9.77**
Sustainability		
Continuity of the livelihood program introduced under the project	The Goat, cattle rearing along with house yard poultry is going to be enhanced in the due course of time due to the profit and reinvestment of savings on the activity. One example of a loan taken for tiffin service and tent house services from savings has been recorded in the beneficiary household. There is huge demand for loan to procure cattle despite the contribution of the beneficiaries have gone up due to the higher price of the milk animal. Goat rearing is done by themselves without any financial support.	9.8
Continuity of the revolving fund and extending loans	Ether is an average 9-10 lakh rupees available with the SHGs and they are going to revolve the fund in the near future for the diverse economic activities besides loan for cattle procurement	9.8
Reduced dependency on the local money lenders	There is no report of local moneylenders; farmers are only approaching banks and government cooperatives for loans and assistance to start livelihood activities. Examples, like honey keeping, sericulture and other activities.	9.9
Integration with the government, bank credit system	There are several examples of taking bank loans to establish sericulture, beekeeping, seed procurement, etc., along with SHG support. These are some of the successful livelihood activities of the local community	9.6
Maintenance of livestock	Beneficiary themselves meeting the requirement of Cattle and Goat sheds. They have been visiting the cattle camps and veterinary hospitals regularly for consultation, vaccination, insemination, and other health supplements, mineral mixtures, and balanced concentrate feeding to improve milk yield and animal health.	9.9
Adoption of animal health care practices	They have adopted administration of regular deworming, artificial insemination and administration of health supplement such as mineral mix, which was recently introduced by the agency in the project villages	9.8

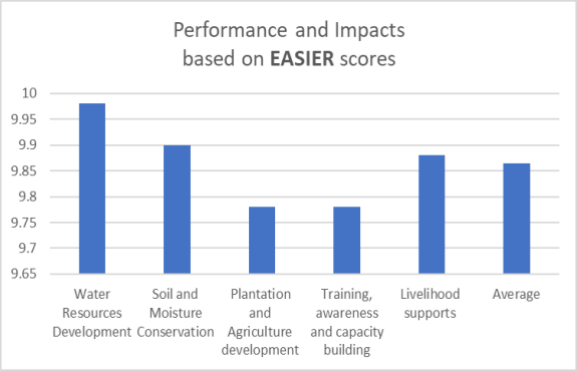
Investment of interest on diversified activities and community activities	Recently they spent 2.5 lakh and 3.0 lakh on construction of paddy threshing yard. They also opened loan to other activities like tiffin center, etc.	10
Average		**9.83**

Impact		
Increase in household income from livestock's	There is a net savings of Rs. 4000-5000 per animal per year. They expect it will be more once they complete the repayment, which is about 80% of the total savings from selling the milk.	9.8
Improvement in household savings and payment towards household expenditures	Beneficiaries have admitted that they are getting 2 litres of milk and diverse chemical-free vegetables, which have not met their dietary requirements, and savings from household daily expenditure. They are using the savings for cultivation and payment towards school fees.	9.8
Enhanced nutrition	Beneficiaries are in the opinion that due to the milk, egg and vegetable the nutrition of the diet has improved a lot	10
Improved resilience to the climate risks	Goetery and poultry are climate-resilient activities. Beneficiary is in the opinion that during the drought it helped them a lot.	9.7
Empowerment of women and participation	Women oriented towards the livelihood activities, which can be recorded from the performance of SHGs and small and micro livelihood activities like poultry and goat rearing	10
Average		**9.86**
Efficiency		
Cost per livelihood support	The agency provided cage, and 20 chicks to widow, landless women, single parent for establish the house yard poultry with an average cost of Rs. 20000.00. Rs. 1.5 lakhs towards establish a solar dryer in Beemandpalli. They also provided them with a mineral mix to enhance milk production. It is an integrated activity, hence the cost encouraged on the agriculture development is also contributing the livelihood generation.	10
Fund utilization efficiency and savings	SHGs efficiently utilising the RFA and enhanced their savings due to the regular repayment along with 12% interest of the lending. Tjis is going to continue beyond the project period by the active SHGs	10
Income against the loan	12 percent loan has been recovered which helped to enhance their savings and invest on the village needy work.	10
Collective decision on interest and loans	As mentioned earlier, they took a decision to establish a thrashing yard with a cost of 3 lakh	10
Average		**10**
Relevance		
Relevance of livelihood support to local conditions	The project area is semi-arid climate, limited and erratic rainfall, and predominance of small and marginal landholdings make livestock-based livelihoods a suitable and resilient income option. Cattle and goat rearing are traditionally practised by local communities and can be effectively integrated with rainfed agriculture, providing a steady income and diversifying risk. Backyard poultry is well suited to homestead conditions and offers quick returns, particularly benefiting women and landpoor households.	10

Suitability of livestock interventions to landholdings and resources availability	The dominance of small and marginal farmers limits the viability of crop-only livelihoods, making livestock an important and complementary income source. Cattle and goat rearing require relatively little land and can effectively utilise crop residues, common grazing resources, and fodder cultivated on bunds and homesteads. Goats, in particular, are well adapted to dry conditions and can thrive on sparse vegetation, making them ideal for resource-constrained environments.	10
Alignment with the beneficiary's skill, preferences and traditional practices	Livestock rearing has long been an integral part of the local farming systems, with households possessing traditional knowledge related to animal care, feeding, and basic disease management. Backyard poultry is commonly practiced at the household level, especially by women, and is culturally accepted as a source of supplementary income and nutrition. Goat rearing is traditionally preferred in semi-arid conditions due to its low input requirements and adaptability to local grazing resources.	9.8
Relevance of revolving fund size to enterprise needs	It was received well and SHGs have initiated issue of cattle and goat loan to the members. There is a demand by the SHGs that the loan amount of Rs. 50000.00 is too less to procure high yielding milk animal.	9.8
Inclusiveness of women, marginal farmers and vulnerable households	The support to establish house yard poultry was extended only to widow, landless women, single parent. The loan priority was also given to the marginal land holders and BPL category members.	9.9
Convergence with the government schemes and CSR resources	The activities under livelihood head of the project are well aligned with state schemes implemented through departments like Rural Development, Agriculture, Horticulture, Animal Husbandry, and the Tamil Nadu State Rural Livelihood Mission. Whereas CSR resources play a catalytic role by addressing local gaps, piloting context-specific livelihood models, and strengthening community institutions so that government schemes ensure continuity and scalability.	9.9
Average		**9.9**

The Overall Impact Assessment score based on the EASIER Framework is 9.86, which can be considered very good performance in terms of project planning, implementation strategy, and impact generated.

Component	**EASIER Score**
Water Resources Development	9.98
Soil and Moisture Conservation	9.9
Plantation and Agriculture development	9.78
Training, awareness and capacity building	9.78
Livelihood supports	9.88
Average	**9.86**



2.3 Visibility and acknowledgement to Titan by the respondents

Based on the respondent's response, it can be concluded that the beneficiary's perception of the Titan and its CSR program is very high. They liked all the activities carried out under the CSR project. They suggested that the CSR work should also be extended to other villages of the region. They reported that it is to access and get benefitted under the Titan CSR project. The staff support is crucial for them in every stage of the project activity, and due to that, it enhanced their benefits from the project activity. Titan's role in their village's development is highly appreciated by the villagers, and it has been helping them obtain the essential support and input needed to earn their livelihood.

Table 2.37: Response to CSR programs

		Perception on the Titan's in the project/ area	Which activities you liked the most	Upscaling and extending work in other villages
Krishnagiri	Bhimandapalli	Very high	All	Yes
	Puliyacheri	Very high	All	Yes
	Gollapalli/Oddur	Very high	All	Yes
Tiruvannamalai	Arattavadi	Very high	All	Yes
	Porasapattu	Very high	All	Yes
	Thazhaiyuthu	Very high	All	Yes

2.4 Continuity of Projects and immediate and Long-Term Impacts of the project

Continuity of the project beyond the project period solely depends on the continuity of the grassroots institutions created or revised during the project period.

Institutional continuity:

Under the project the project implementation partner, NAF formed VDCs and SHGs to operate and maintain the assets created under each project components. Hence the continuity of the project largely depends on the continuity of the activities by these institutions. They certainly going to be active by enhancing the activities and maintaining the village assets created.

UGs are the institutions created to create village assets (village ponds, percolation ponds, check dams, and other water harvesting structures), sharing the benefits and maintaining the assets.

The SHGs will maintain their relationship with the line departments for the convergence of agriculture, horticulture, plantation, sericulture, animal husbandry, and other livelihood and food security schemes and programs and also for the maintenance of ponds, check dams, etc.

The VDCs are responsible for village commons and assets created and their continuity. They will also be responsible for the convergence of the activities and continuity of the project beyond its implementation period.

Short-term and immediate benefits:

From the community interaction, it is evident that they are already in the process of scaling dairy, goat rearing, fishery, houseyard poultry, home gardens, fodder plots, agroforestry, and sericulture through SHG savings as well as lending from banks, etc., so as to increase and diversify income.

Under the program, several skill development and capacity development programs, exposure visits, onfarm demonstrations, SHG functioning training, and animal camps have been organized. These programs sensitized them and provided exposures to livelihood opportunities and skills to diversify their livelihood activities in the villages. They are in progress, and it is going to yield both short- and long-term project benefits.

The organic farming input is suitable to the site and received well in the project villages. The inputs such as vermicompost units, Panchkavya, and other composting units are cost-effective and can be replicated and enhance the number of units among the farming community. The organic input has helped to reduce the input cost by Rs. 10000 to

Rs. 15000 per ha. And motivating the farmers. These have immediate and long-term project benefits in the project villages.

The rainwater harvesting structures and soil and moisture conservation components have already shown positive results and confirmed both short- and long-term benefits. The increase in the water level in the wells, water storage behind the structures, and silt deposition behind the structures is going to yield a longterm benefit to the community in terms of enhanced irrigation, gross cropped land, and productivity. The village ponds are not only useful for irrigating the individual farmland but also for micro-pisciculture. The farmers are taking one to two crops depending on the water availability in the streams and wells.

Long-term project impact

The different components of the project will contribute multidimensional impacts. Based on the nature of the components and long-term impacts, such as:

The site-specific project components such as agroforestry, agrohorticulture, vetiver grass, fodder plots, and water harvesting and soil and moisture conservation activities have long-term project impacts. The increased vegetation cover and fruit-bearing trees have reduced the land degradation. It has also been reported that the check dam constructed in the upper reaches of the watershed feeds the wild animals. Further, all these project components are helping in soil conservation, soil productivity, and biodiversity, which have long-term environmental and ecological impacts.

Increased groundwater recharge and water level in the wells are going to improve the water yield and irrigated potential in the future also. These structures are suitable to the semi-arid conditions and optimized rainwater harvesting. The channel clearance and soil and moisture conservation work have improved the soil moisture and soil productivity, which is going to increase the net cultivated land.

Surface water and reduced runoff due to strategically constructed/renovated check dams, village ponds, percolation tanks, etc. During the field visit these structures are filled with optimum water and help gravity irrigation. The reduced runoff has also been reported by the command area farmers.

Climate-resilient, drought-resilient farming has been reported. The increased and improved supply of water from the wells and surface water structures is going to have long-term impacts. The cropping pattern has changed to high-yielding and economically viable varieties. The fallow land has been brought under agrohorticulture due to the increased water for irrigation. Precision irrigation, like drip irrigation, is in practice, and they are going to be further diversified among the farming community. These are the sustainable and climate-resilient farming initiatives going to have long-term benefits. The diversification and increased cropping intensity are going to have long term benefits among the cultivators. The organic inputs and technical skill in intercropping and SRI are going to have a longer impact. The soil and moisture conservation activity, such as farm bunding, farm outlets, and gully plugging, will improve the soil moisture and reduce soil erosion, and improved soil fertility will also have the long-term benefits.

The project will have immediate and long-term economic impacts. A revolving fund and livestock support will help to earn and enhance livelihood, which is motivating the village women to diversify and upscale the livestock-based livelihood activities. These are the immediate as well as long-term benefits to the project beneficiaries and villages as a whole. The improved livelihood opportunity due to vegetable pandals, fodder farming, and vegetable cultivation is beneficial and will motivate and will have a positive impact on the outmigration from the project villages.

The project activities will have long-term social impacts. The SHGs, UGs, and VDCs have been strengthened under the project, and it is going to ensure the continuity of the project and long-term impacts. The improved women's participation in the project activities, improved food and nutritional security, and child care and education are a few impacts going to be had long-term impacts.

2.5 Incisive and meaningful outcome insights

The HEAD project of NAF has been implicitly woven into implementation moving from baseline improvement and infrastructure to community adoption and ultimately institutionalization and sustainability over time.

A. Baseline Development & Resource Rehabilitation

To meet this, major component of the project includes, soil and water conservation structures (pond creation and rejuvenation, percolation tank, check dam, channel clearance, etc.) and other interventions to treat watershed so as to improve infiltration and moisture retention in the field; plantations, fodder plantation for green cover and erosion control.

Sustained Impact over Multiple Years:

Groundwater recharge & stabilized water tables: Conservation works increase long-term availability of water for irrigation and livestock beyond project years.

Ecosystem restoration: Thousands of saplings planted (>20,000 in project villages) grow into perennial vegetation, enhancing biodiversity and soil protection long after project completion.

Reduced runoff & improved microclimate: Soils hold moisture across dry seasons, reducing climate vulnerability

B. Adoption of Sustainable Agriculture & Livelihood Integration

Transition communities to sustainable production and diversified income interventions like promotion of organic farming practices, biofertilizers, organic pest management, and reduced chemical inputs; training on climate-smart techniques and lean farming and support for agro-horticulture and small enterprise skills (SHG supported household livelihood activities).

Annualized, Multi-Year Impact:

Yield and input efficiency improvements: Long-standing adoption of organic and climate-adapted practices reduces costs and builds soil fertility over years.

Community resilience: Reduced dependence on synthetic inputs and enhanced farm profitability persists across seasons.

Skill diffusion: Knowledge cascades across farming communities beyond direct beneficiaries

C. Community Empowerment & Institutional Sustainability

To build local institutions that uphold project gains over time activities and interventions like SHG formation and strengthening with women's groups and community leadership; orientation programs, skill and capacity building for sustainable resource management and encouraging community-led maintenance (e.g., field bunds, ponds), etc.

Long-Term Effects (Annualized Continuity):

- Social capital & grassroots governance: Functional groups continue sustaining and scaling investments, e.g., savings funds, collective action to diversify the livelihood and small and micro enterprises.
- Empowerment outcomes: Women and marginalised households gradually build economic stability — not just in the project period but as part of their livelihood portfolios.
- Maintenance culture: Community-led upkeep of structures ensures physical assets remain effective years after external funding ends. D. Project impacts in terms of multiple years

i. Environmental & Ecological

- Improved soil health and organic matter that accumulates year after year.
- Sustained water availability from enhanced recharge — buffering seasonal droughts. Long-term biodiversity growth as plantations matures (twenty years of age).

ii. Economic & Livelihood

- Reduced input costs + stable yields increasing net farm income over time.
- Enhanced market participation through agro-enterprises, facilitated by SHGs and producer groups.

iii. Social & Institutional

- Strengthened SHGs and collective groups that persist as community assets.
- Ongoing capacity retention that enables adaptation to new challenges (e.g., climate change).

III. UN SDG alignment to the Titan CSR Project

Based on the review of the project activities and the wisdom of the project stakeholders, including the project beneficiary and the village commons, a mapping of the UN Sustainable Development Goals has been prepared. Following are the UNSDGs and contribution of the project into the SDGs.

 SDG 1 – No Poverty	• The WRD activities enhanced water resources, strengthened agriculture and allied livelihoods by reducing crop failure risks, improving production potential, and increasing income opportunities, thereby enhancing livelihood security for rural households. • The SMC activities improved agricultural productivity and reduced land degradation result in higher and more stable farm incomes. Tree plantations and fodder from vetiver provide additional livelihood options, supporting poverty reduction. • Diversification through horticulture, agro-forestry, vegetables, and fodder reduces dependence on single rainfed crops and improved income stability for small and marginal farmers. • Revolving funds, available with enhanced access to timely and affordable credit for SHG members, lower reliance on informal moneylenders. Livestock-based activities such as dairy, goat rearing, and backyard poultry generate regular income and help households manage market risks. • Capacity-building initiatives improved skills and awareness, enabling adoption of improved farming and livestock practices. Exposure visits facilitated replication of successful models, reducing livelihood risks and improving income stability.

 SDG 2 – Zero Hunger	• Improved water availability from WRD activities enabled protective irrigation, increased cropping intensity, and stabilised agricultural production, thereby contributing to food security and improved farm productivity. It has helped improve soil fertility and conserve moisture. Stable yields and reduced crop failure risks thereby support food security and sustainable agriculture among marginal farmers. • Agro-horticulture, home gardens, vegetable pandals, and diversified cropping systems enhance household food and nutritional security by ensuring year-round availability of fruits and vegetables. Fodder plots support livestock productivity, indirectly strengthening food systems through integrated farming. • Dairy and backyard poultry enhanced household access to nutritious food such as milk, eggs, and meat. Increased livestock productivity also supporting integrated farming systems, strengthening local food security in the project villages. • Agri-tech training, demonstrations, and animal health camps directly contributing to improved crop yields, livestock productivity, and food availability. Knowledge on improved practices has been enhancing food and nutrition security at household and community levels.
 SDG 3 – Good Health and Well-being	Animal health camps helped improve livestock health through vaccination, deworming, and disease prevention, reducing economic losses and improving household nutrition by boosting milk, meat, and egg production.

 SDG 4 – Quality Education	Orientation training, agri-tech programmes, and field demonstrations has provided practical, context-specific learning to farmers and livestock holders. Continuous skill development improved functional literacy, and lifelong learning opportunities.
 SDG 5 – Gender Equality	• Home gardens, vegetable pandals, and the preparation of organic inputs actively involve women, strengthening their roles in household nutrition, income generation, and decision-making within farming systems. • SHG-based revolving funds and backyard poultry enterprises actively engaging women, enhancing their financial inclusion, leadership, and decision-making power at household and community levels. • Women's participation in training, exposure visits, and skill programmes strengthened their confidence, leadership, and decisionmaking.
 SDG 6 – Clean Water and Sanitation	• The WRD activities have enhanced rainwater harvesting, improved groundwater recharge, and increased the availability of surface and groundwater resources. Rejuvenation of ponds and construction of recharge structures improved water security for drinking, agriculture, and livestock, particularly during low rainfall years/ seasons. SMC structures are helping to slow surface runoff and enhance groundwater recharge by increasing infiltration. Improved soil moisture retention supported sustainable use of limited water resources in over-exploited aquifers, contributing to long-term water security. • Agro-forestry and organic farming practices improved soil structure and moisture retention, reducing irrigation demand and improving water-use efficiency.

 SDG 8 – Decent Work and Economic Growth	• Construction and maintenance of water conservation structures generated local employment, while improved water availability supports sustained agricultural and livestock-based economic activities. • Plantation activities, nursery management, vegetable cultivation, and organic input preparation generated on-farm and off-farm employment opportunities, particularly for women and landless households. • Livelihood support interventions generated self-employment and onfarm economic activities suited to small landholdings. • Skill development and demonstration-based learning promote selfemployment, entrepreneurship, and productivity enhancement in farming and allied sectors, supporting inclusive economic growth.
 SDG 10 – Reduced Inequalities	Targeting small and marginal farmers, women, and land-poor households ensured inclusive access to livelihood assets and financial services, reducing socio-economic disparities among the village communities.
 SDG 11 – Sustainable Communities	• Restoration of village ponds and village watershed structures strengthens local institutions, promotes collective action, and enhances the sustainability and resilience of rural settlements. • Community-managed bunds, check dams, and plantations strengthened collective action and local stewardship of natural resources, enhancing the sustainability and resilience. Communitybased plantation and agricultural development enhance local food systems, strengthen the resilience of rural settlements, and promote the sustainable use of common and private lands.

	Strengthened SHGs by revolving funds, promoted community cohesion, collective action, and sustainable rural livelihoods, enhancing the resilience.
 SDG 12 – Responsible Consumption and Production	• Organic farming inputs such as compost, vermicompost, biofertilisers, and bio-pesticides helped reduce reliance on chemical inputs, supporting environmentally responsible and resource-efficient agricultural production. • Livestock interventions helped promote the efficient use of locally available resources, such as crop residues, fodder plots, and animal waste, supporting sustainable production systems. • Training on sustainable agriculture, integrated pest management, organic inputs, and improved livestock practices encourages efficient resource use and environmentally responsible production systems.

 SDG 13 – Climate Action	• The water conservation measures undertaken in the project has strengthen local climate adaptation capacity. They help communities cope with climate variability and reduce vulnerability to extreme weather events due to increased water security. • Vetiver slips and plantations helped to stabilize soils and improve moisture retention, increasing the resilience of farming systems to climate variability. • Agro-forestry and perennial horticultural systems enhance carbon sequestration and reduce vulnerability to climate shocks such as droughts and heat stress. Crop diversification and organic practices improved adaptive capacity in the villages. • Small ruminants and backyard poultry are climate-resilient livelihood options well suited to the project villages looking at the frequent drought conditions. Hence, the diversified income sources reduce climate-related risks and improve adaptive capacity of rural households. • Agri-tech programmes and exposure visits helped to promote climateresilient practices such as drought-tolerant crops, water-efficient farming, integrated farming systems, and improved livestock management, strengthening adaptive capacity in project villages.
 SDG 15 – Life on Land	• Nala treatments, check dams, and sunken pits are helping to reduce soil erosion and land degradation, while improved soil moisture supports vegetation growth and biodiversity. Rejuvenated water bodies also create micro-ecosystems that enhance ecological balance. • Loose rock check dams, vetiver slips, and tree plantations reducing soil erosion, and restore degraded lands. These interventions have promoted biodiversity, improved soil health, and contributed to land degradation neutrality. • Tree-based farming systems, fodder plots, and plantations contributed to land restoration, biodiversity enhancement, and improved soil fertility, thereby helping combat land degradation in fragile watershed landscapes. • Knowledge dissemination through demonstrations and trainings supporting sustainable land management, soil conservation, and ecosystem restoration by promoting practices that reduced land degradation.
 SDG 17 – Partnerships for the Goals	□ Exposure visits, convergence-oriented trainings, and animal health camps strengthen linkages between communities, government extension services, technical institutions, and CSR initiatives, fostering multi-stakeholder partnerships since the inception of the project activities.

IV Observation and Recommendations

HEAD is a three-year integrated village development project (2022–2025) across rural clusters in Tiruvannamalai and Krishnagiri, Tamil Nadu. It aims to strengthen environmental conservation, sustainable agriculture, livelihoods, and socioeconomic status of resource-poor families through a systems approach involving soil-water conservation, agroecology, capacity building, and community empowerment.

The following are observations and conclusions based on the field survey, stakeholder interactions, and interviews.

The continuity of a home garden requires strong back-and-front-hand support: Under the project, a home garden was planned, and a kit of 20 seeds was provided to the project beneficiaries. These seeds are to be used as per convenience

to meet their nutritional and micro-livelihood needs. However, due to poor skills in seed handling and preservation, success with it over the years was rare in most cases. Only a few types, such as chilli, are successfully raised and sold in the market. Strong, well-coordinated front-end and back-end support is necessary to ensure the continuation of home garden support. For successful establishment and adoption by other farmers as well, frontend support in the form of prompt input supply, capacity building, technical advice, and community mobilization is crucial. Strong back-end support, such as availability to water and organic inputs, market or consumption linkages, convergence with line departments, and followup extension services, is equally crucial. When combined, these resources increase household nutrition, boost livelihood resilience, and reinforce sustainability in the project communities.

Long-term, need-based support for transforming backyard poultry: There are a few cases of early dropouts. Building confidence and lowering early dropout rates requires ongoing technical assistance, prompt veterinarian care, access to high-quality chicks and feed, and knowledge of better management techniques. Viability can be improved by fortifying forward linkages for guaranteed local selling and backward linkages for inputs, as well as by combining with animal husbandry departments.

Promotion of goat rearing: Building on the current SHG-led loan mechanism, a systematic and long-term approach is needed to further encourage goat husbandry in the project area. Goat farming remains a viable and robust way to make a living, especially given the prevalence of marginal farmers and the current water and soil poverty. By providing technical assistance, the project should improve SHG-based credit and guarantee prompt access to high-quality breeding stock and reasonably priced insurance. To reduce mortality and increase output, capacity-building in scientific goat rearing techniques—such as housing, feeding, breeding, and disease control—is crucial. It is necessary to continue routine veterinary care in coordination with the Animal Husbandry Department through health camps, immunisation campaigns, and deworming. It will boost confidence, guarantee asset retention, and support long-term livelihood stability of female goat rearers.

Fodder resources: Due to the region's growing cattle population and scarce common grazing resources, there is a significant need for fodder plantations. Feed scarcity in communities will be greatly alleviated by promoting community-based fodder resources, such as fodder plots, azolla units, and the effective use of crop wastes. Additionally, promoting collective marketing and input procurement through SHGs or producer groups can increase price realization, lower input costs, and improve the overall viability of goat husbandry.

Agro-Horticulture, agroforestry: Given the increasing incidence of droughts, soil degradation, and water scarcity, integrating perennial trees with annual crops enhances farm resilience and income stability. Survival rates can be increased by offering high-quality planting material and expert advice on pit preparation, mulching, spacing, and moisture-conservation techniques. Long-term success depends on connecting agro-horticulture and agroforestry treatments with soil and moisture conservation techniques, including field bunds, trenching, and mulching. Fruit and multipurpose tree species that are suitable for the local climate, drought-tolerant, and waterefficient should be the main focus of promotion. Survival rates can be increased by offering highquality planting material and expert advice on pit preparation, mulching, spacing, and moistureconservation techniques. Long-term success depends on connecting agro-horticulture and agroforestry treatments with soil and moisture conservation techniques, including field bunds, trenching, and mulching. Sustainability will be improved by promoting convergence with the departments of agriculture, forestry, and horticulture for extension, insurance, and subsidies. Further enhancing livelihood stability and lowering climate risks are community-based nurseries, collaborative input procurement, and the promotion of fuelwood and fodder species within agroforestry systems.

Groundwater is a critical resource for sustaining agriculture in the region; therefore, initiatives to augment groundwater are of collective community interest. In this context, systematic mobilisation of farmers to adopt farm ponds, recharge pits, and other aquifer recharge structures on private lands is essential to enhance local water security and drought resilience. Such efforts should be supported through technical guidance, alignment with government schemes, and community awareness of the long-term benefits. In addition, the Gram Panchayat should proactively engage with the Rural Development Department and allied line departments to facilitate the construction and strengthening of percolation tanks, check dams, and other recharge structures on suitable revenue and forest lands.

Awareness and skill development programmes for farmers and SHGs are effective only when supported by self-financing capacity and access to timely and affordable financial options. While training enhances knowledge and skills, the ability to apply these learnings depends on the availability of own savings, revolving funds, and easily

accessible credit. Hence, linking capacitybuilding initiatives with bank credit and aligning them with government financial schemes ensures the adoption, continuity, and sustainability of livelihood activities in villages.

Self-Help Groups (SHGs) are functioning effectively in the project area, and enhancing the revolving fund can significantly strengthen livelihood outcomes. At present, a loan of ₹50,000 is inadequate to procure high-yielding milch animals and meet the rising costs of feed and basic management. This gap can be addressed by linking SHGs with government livestock development schemes and rural banks to access higher-value loans and subsidies for the procurement of cows, buffaloes, and feed. Strengthening such financial linkages will improve milk productivity, enhance household income, and contribute to long-term livelihood security for SHG members.

Monitoring of development activities by village youth is critical to the success of any programme, as sustainability depends on community ownership of the assets created and the realisation of their benefits. Therefore, it is important that the village youth actively participate in regular monitoring of project activities and provide timely feedback. Their involvement will strengthen accountability, improve implementation quality, and contribute to the overall success of rural development initiatives.

Provision of transport and marketing assistance, along with an increase in loan amounts, is essential under the project activity. The rising cost of high-value cattle and goats, coupled with increased feed and disease management costs, has rendered existing financial support inadequate for SHG members. In this regard, it is also important to strengthen transport facilities and market linkages to reduce transaction costs and improve price realisation. This will enhance credit support for beneficiaries to invest in quality livestock and proper livestock health care.

Strengthening seed management in home gardens and fodder plots is essential for sustainability and cost reduction. Establishing community-level seed banks and community training on seed selection, preservation, and storage will ensure timely availability of quality seeds to growers. Thus, capacity-building for farmers and SHG members in seed-saving and exchange practices will enhance the continuity of home gardens and fodder plots in the area.

Solar dryers: One solar dryer was established as part of the scheme, and SHGs are using it to add value to vegetables, leaves, and other items. For the project villages to adapt, it is crucial to promote reasonably priced solar dryers. Bamboo or wooden frames, UV sheets, wire mesh, and black-painted metal sheets are among the affordable sun-drying options available. For best use, these dryers could also be installed in public spaces. To manage basic repairs, drying techniques, hygiene, and operation, farmers and SHG members must receive training. Convergence with government initiatives from the departments of cooperatives, horticulture, and renewable energy can reduce capital expenses.

Livestock insurance: Villagers obtained insurance for a few livestock. This should be in total in the project villages. For that, community mobilisation is needed, and coordination with the line department is essential. For that, the community institutions should be entrusted with the responsibility so that all livestock can be insured.

Enhancing the scope of the loan to other economic activities undertaken by women in the project villages. There was one example of extending the loan to the tiffin business. But there are funding constraints with the SHGs to extend loans to other microenterprises. Hence, the SHGs need to establish links with banks or other financial institutions to secure support and cooperation in obtaining loans for potential proposals.

More thrashing yards and drum seeders to enhance paddy cultivation in the project villages. The thrashing yard was established while using the interest earned by the SHG. The villagers need more such yards and are also requesting the procurement of a drum seeder. This can be taken care of by the government schemes and programs. The VDC can approach the agency for agricultural implements, and the FCI for the required infrastructure.

The evaluation recommends starting the withdrawal mechanism based on the performance, successful completion, and execution of the planned operations. It is crucial for empowering local organizations and communities to autonomously oversee and maintain the advantages. The implementation partner and NAF facilitation should withdraw progressively, handing up duties to SHGs, User Groups, Watershed Committees, VDCs, and Gram Panchayats. The NAF should specify exactly who is responsible for upkeep, how the benefits of assets built on the village commons will be shared, and how community resolutions will formalise the dispute-resolution process.

V Conclusion

The HEAD project of NAF has been successfully implemented from 2022 to 2025 in two clusters, Beemandapalli and Thazhaiyuthu, and has brought transformative changes in natural resources, women, and the community as a whole. There is a significant change in water resources, soil health, and the livelihoods of poor and marginal communities. The project is successfully bringing the community together and driving collective action that benefits more than 45% of the village population. The collective action not only institutionalised village development but also empowered the community to initiate livelihood activities and improve the nutritional content of their diet.

The Water Resource Development and Soil and Moisture Conservation work have addressed the community's basic needs through water security and soil conservation. The integrated agricultural development with tree planting increases climate-resilient cropping in the project villages. The capacity-building programs have improved cultivation practices and enhanced returns from cultivation. The increased arable land and gross cropped area within a short span of time have built confidence among villagers to enhance their cultivation and adopt climate-resilient, modern cultivation practices. Organic cultivation is gaining momentum, and it is expected that, in the coming years, this will be further enhanced through the replication of organic inputs. The capacity building, skill development, and field demonstrations of sustainable agriculture and livelihood generation have enhanced the community's resilience to climate change and market vulnerabilities. User charges, maintenance funds, or corpus creation for common assets must be established to meet future repair and management costs as required.

The lively support program introduced in the area is site-specific and well-suited to the landscape, community skills, and economic conditions. The SHGs are functioning well, and it is expected that they will continue to work in harmony beyond the project period as well. There is a need to link the SHGs' accounts and functioning with the State livelihood programs and financial institutions for easy access to loans and the transfer of technology.

Women's participation in development and capacity-building activities has increased as well, indicating women's empowerment through the project activities and SHG functioning. The animal health and care camp provided the livestock rearer with the opportunity to interact with and understand sustainable livestock management and the benefits of livestock rearing. There is some initiative by the SHG members to diversify livelihood activities, such as sericulture, setting an example for others. It is expected that, in the coming years, a greater number of women will come forward to start a wide variety of livelihood activities, which they learn about and gain exposure to during the program's capacity-building programs. SHGs should be supported to strengthen savings, revolving funds, and access to bank credit to expand women's enterprises.

The enduring impact of the HEAD projects extends beyond tangible results in water conservation and agricultural advancement. They have fostered a sense of ownership and pride within the communities, cultivating a culture of self-reliance and environmental stewardship. This is certainly a collective effort of TITAN and NAF, showcasing the positive outcomes while demonstrating the partnerships in creating meaningful and lasting change.

The efforts of NAF and the dynamic project teams' rapport with villagers are visible in the project villages. Villagers wholeheartedly acknowledge the NAF and Titan for their timely and muchneeded support in helping them establish water and resource security, a knowledge base, and sustainable livelihoods in the area.

The project showcased a sustainable model in the overexploited semiarid region of the state. The three years of activity have created a sense of ownership and built self-reliance among the poor and marginalised villagers. The project can now initiate the withdrawal mechanism so that the community can continue work for their betterment.

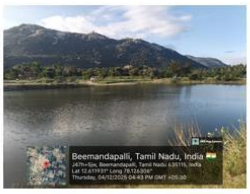
The evaluation recommends initiating a withdrawal mechanism based on performance, successful completion, and execution of the scheduled actions. It is crucial to empower local organisations and communities to oversee and maintain the benefits autonomously.

Field Photographs

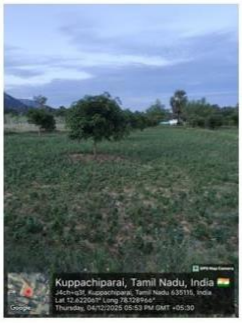
Beemandpalli cluster

Meeting with villagers

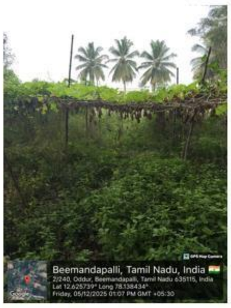
Water and fodder plantations Beemandpalli cluster



Beemandpalli cluster Vermi bin, cattle, plantation



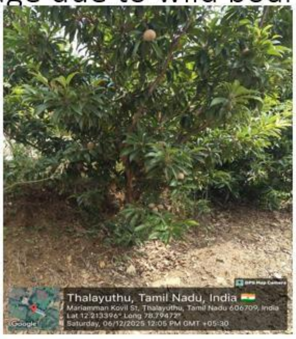
Beemandapalli , vegetable pandal and farm pond

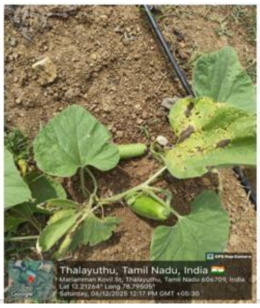


Arattavadi, Thazhaiyuthu cluster. Channel clearance, restoration of MCD and pond restoration and impact agriculture – paddy field

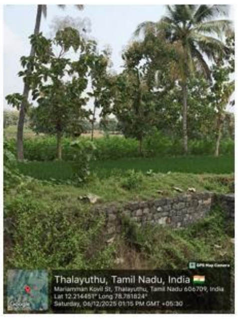

Arattavadi and Thazhaiyuthu, Thazhaiyuthu cluster. SHG meeting and threshing yard

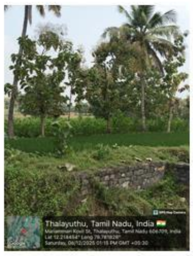
Thazhaiyuthu, Thazhaiyuthu cluster plantation, agro-horticulture, vegetable and damage due to wild boar



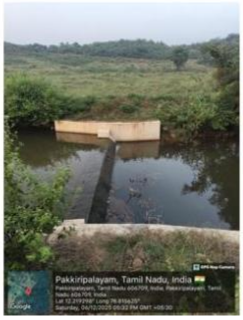


Sericulture and mulberry plantation, Thazhaiyuthu cluster





Water Resource Development Thazhaiyuthu cluster



Community plantations , house yard poultry and Azolla, Thazhaiyuthu cluster

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