An Impact Assessment Report of the Holistic Environmental and Agriculture Development (HEAD) Program

Implemented by National Agro Foundation

Study Conducted by

Social Audit Network
2024 – 2025

Contents

1. Introduction

Environmental and Agricultural Development is becoming increasingly important due to the growing pressures of population growth, urbanization, and climate change. Natural Resource Management plays a vital role in balancing the ecosystems that provide essential services, including water supply, flood regulation, and habitat for biodiversity. However, unsustainable practices such as deforestation, over-extraction of water, and pollution have degraded the ecosystem, leading to water scarcity, loss of biodiversity, and increased vulnerability to natural disasters.

By managing natural resources sustainably, we can protect water quality, maintain ecosystem functions, and enhance resilience to climate change impacts like floods and droughts. This approach nurtures a thriving environment, promotes sustainable agriculture, and enhances soil health, ultimately improving the livelihoods of the communities.

The Holistic Environmental and Agriculture Development (HEAD) Project is a collaborative effort between Titan India Limited (Titan) and the National Agro Foundation aimed at promoting sustainable agriculture and environmental development. This partnership highlights Titan's commitment to social and environmental responsibility.

About Titan & its CSR

Titan, part of the Tata Group, is one of India's leading lifestyle companies renowned for its wide range of products, including watches, jewelry, eyewear, and accessories. Committed to innovation and customer satisfaction, Titan is a prominent name in both the Indian and international markets. Environmentally, Titan is dedicated to sustainable manufacturing and has taken steps to reduce its carbon footprint by promoting renewable energy and waste management practices.

Titan's Corporate Social Responsibility (CSR) initiatives focus on sustainable development, strongly emphasizing girl child education, skill development, and environmental conservation. Titan actively engages in environmental projects as part of its CSR, focusing on sustainability and ecological conservation. It also emphasizes water conservation, adopting rainwater harvesting, wastewater recycling, and efficient water usage techniques to reduce consumption. The projects reflect Titan's commitment to reducing its ecological footprint and promoting a greener, more sustainable future. With community-centric projects, Titan's CSR efforts aim to create a lasting positive impact across India.

National Agro Foundation

National Agro Foundation (NAF) is an Indian non-governmental organisation (NGO) focused on agricultural and rural development. Founded in 2000 by C. Subramaniam, a former Indian politician and the architect of India's Green Revolution, the foundation aims to promote sustainable agricultural practices, enhance rural livelihoods, and ensure food

security.

NAF has been actively involved in sustainable watershed activities, agriculture development and livelihood programs as part of its efforts to promote sustainable agricultural practices and rural development. They have the expertise to implement watershed management practices, particularly in regions that rely on rain-fed farming. NAF conducts training and capacity-building activities to empower farmers and local stakeholders, ensuring that the communities' involvement in managing watershed structures and practices sustainably.

The primary goal of the Holistic Environmental and Agriculture Development (HEAD) Project is to enhance the self-resilient ecosystem and sustainable agricultural practices. NAF has implemented the HEAD Project in revenue villages of the Beemandapalli cluster of Krishnagiri District and Thazhaiyuthu cluster of Tiruvannamalai District.

2. Objective of the Study

Titan partnered with NAF for the implementation of the Holistic Environmental and Agriculture Development (HEAD) Project. Titan engaged SAN India to conduct a comprehensive impact assessment of these projects for a period of 2023-2024. The purpose of this assessment is to evaluate the implementation process, measuring the achievements, and assess the relevance of the projects to the targeted communities. It will also analyze the impact created and examine the sustainability of the outcomes.

The main objective is to evaluate the effectiveness of the HEAD project and its long-term benefits for the communities it serves. This assessment also examines the socio-economic and environmental impacts on the targeted villages, evaluates the sustainability of the project's benefits, and provides recommendations for future similar initiatives.

3. Methodology

The SAN team comprising of Ms. Marie Banu and Mr. Pradeep Kumar, Social Auditors and Mr. S. Jothi, Social Impact Assessor conducted the field visits to various locations as part of the assessment process. They were ably guided by Mrs. Latha Suresh, Director, SAN India.

SAN India team employed a multifaceted approach to ensure a thorough evaluation of the project. 10% of the project beneficiaries were consulted, assessing their involvement, the project's effectiveness, and its impact on their daily lives. The field visits involved gathering feedback from stakeholders and beneficiaries through structured consultations. An initial virtual call with the implementing partners' teams were held to finalize the plan and timelines for these consultations.

Focus Group Discussions (FGDs): Discussions with five stakeholder groups across Beemandapalli and Thazhaiyuthu clusters, involving 124 community members, experts, and stakeholders. These discussions, guided by a structured questionnaire, provided qualitative insights into the project's implementation and outcomes.

Observation of Water resources: Observation of the condition and management of the water resource areas to assess the changes and improvements brought about by the project.

Observation of Agricultural Practices: Analysing the shifts in agricultural practices and productivity to understand the project's impact on farming methods and outputs.

Direct Interviews: In-depth interviews with 26 key stakeholders, including project implementers, beneficiaries, farmers, villagers, and experts, to gain a detailed understanding of the project's achievements and challenges.

These methodologies have provided a diverse evaluation of the HEAD project, ensuring an in-depth analysis of their implementation, achievements, relevance, and sustainability.

4. Scope of the Assessment

The scope of the Impact assessment is for the period April 2023 – March 2024. The assessment was aimed to evaluate the total impact of the HEAD Projects executed by the National Agro Foundation (NAF) with Titan funding during the period. The assessment evaluated the effectiveness of the project's implementation, focusing on the adherence to the timeline (2023-2024), efficient resource allocation, and the active involvement of local communities It further assessed the long-term sustainability of the project's outcomes, including increasing water availability, enhancing agricultural productivity, and improving the socioeconomic conditions in the target villages. Additionally, it examined the environmental impact, specifically the changes in watershed ecology resulting from the project.

5. Geographical Background of Project Area

Water demand is steadily rising in Tamil Nadu, with around 63% of available groundwater resources currently in use. The HEAD project has selected Krishnagiri and Tiruvannamalai districts for implementation due to severe groundwater over-exploitation and a scarcity of clean drinking water in these areas.

Beemandapalli cluster

Thalaiyuthu cluster

Beemandapalli Cluster Overview

The Beemandapalli cluster, situated in the Veppanapalli block of Krishnagiri, Tamil Nadu, consists of three revenue villages: Beemandapalli, Puliyanchery, and Gollapalli. Together, these villages cover a total population of 3,718 individuals, with 1,876 males and 1,842 females, residing in 964 households. Geographically, the Beemandapalli cluster is located near the border of Tamil Nadu, Karnataka, and Andhra Pradesh, with a total area of 1,603.93 hectares.

Of this, wetland accounts for 105.48 hectares, representing 6.57% of the area. This wetland benefits from a perennial water source, making paddy the dominant crop. Most of the land, 946.03 hectares (59.03%), is classified as dryland, comprising 89% of the agricultural area. These drylands rely primarily on rainfed agriculture, with farmers cultivating crops such as sorghum, vegetables, and millets.

Thazhaiyuthu Cluster Overview

The Thazhaiyuthu cluster is in the Chengam block of Thiruvannamalai district, Tamil Nadu, and includes the revenue villages of Porasapattu, Arattavadi, and Thazhaiyuthu. The total population of the cluster is 7,254, with 3,754 males and 3,500 females, spread across 1,792 households. The cluster covers a total area of 2,156.41 hectares.

Agriculture occupies 71% of the land, with over 60% of this being dryland. Farmers in these drylands grow crops like groundnut and black gram, while paddy and sugarcane are the major crops in the wetlands. Some areas also support the cultivation of vegetables

and floriculture. Most drylands experience single cultivation cycles each year, depending on the rainfall received.

Ground Water Level – Krishnagiri District :

Veppanapalli block of Krishnagiri is marked as over exploited by TWAD Board, Government of Tamil Nadu.

Table1: Groundwater level categorized as Over Exploited in project area – Krishnagiri district. [1]

Categorization of Firkas:

The status of Categorization of firkas as of March 2023 for the District in is shown below.

Categorisation Based On Extraction (As On 2023)	No. Of Firkas	Firkas
Over Exploited (>100%)	10	Alapatti, Bargur, Guruparapalli, Kallavi, Mathur, Nagarasampatty, Samalpatti,Singarapettai, Uthangarai Veppanapalli
Critical (90%-100%)	1	Palepalli
Semi Critical (70%-90%)	11	Kelamangalam, Rayakottai,Bagalur,Hosur, Hosur Town, Mathigiri, Krishnagiri, Periyamuthu,Barur, Pochampalli, Berigai.
Safe (<70%)	9	Anchetty, Urigam, Andevanapalli. Denkanikottai, Kakkadasam, Thally, Kaveripattinam, Shoolagiri, Uthanapalli.
Others (Poor & Saline)	-	
Total	**31**	

Further government data sources indicate that groundwater in Krishnagiri has fluoride levels range from 1.5 to 12.4 mg/l, significantly exceeding the WHO guideline of 1 mg/l. This includes the Veppanapalli block falls within NAF's service area. This increased fluoride level in water leads to Dental, Skeletal and Non-skeletal Fluorosis.

The groundwater in Dharmapuri and Krishnagiri has fluoride content between 1.5 -12.4 (mg/l) which is well above the WHO guideline value which is 1 mg/l. Prolonged consumption of this water could lead to Fluorosis. To tackle this problem the Hogenakkal

[1] *Source : TWAD report 2023 , Krishnagiri District profile on water level.* https://www.twadboard.tn.gov.in/content/krishnagiri

drinking Water and Fluorosis Project was proposed.

A news article published in New Indian Express dated on 2nd March 2023 mentioned that the project caters to three municipalities (including Hosur which later became a corporation), 17 town panchayats and 7,639 rural habitations where over 11.94 lakh people were found to have skeletal or dental fluorosis. Last year, the government announced the Hogenakkal 2.0 project will be brought to the Dharmapuri and Krishnagiri districts to ensure that even the most isolated villages in the two districts receive clean drinking water.

Ground Water Level – Tiruvannamalai District : Chengam block of Thiruvannamalai district is marked as over exploited by TWAD Board, Government of Tamil Nadu.

Table 2: Ground water level categorized as Over Exploited in project area – Tiruvannamalai district.[2]

Categorization of Firkas:

The status of Categorization of firkas as of March 2023 for the District in is shown below.

Categorisation Based On Extraction (As On 2023)	No. Of Firkas	Firkas
Over Exploited (>100%)	16	Kelur, Kettavarampalayam, Kilkodungalur, Malaiyur, Melpallipattu, Mullipattu, Pachal, Pudupalayam, Thachambadi, Thatchampattu, Chennavaram, Desur, Chengam, Eraiyur, Thanipadi, Kilpennathur.
Critical (90%-100%)	8	Modayur, Vettavalam, Santhavasal, Thandarampat, Vanapuram, Mangalam, Thurinjapuram , Nayadumangalam.
Semi Critical (70%-90%)	13	Agarapalayam, Peranamallur, Kalasapakkam, Kannamangalam, Polur, Thellar, Somaspadi, Osur, Vandavasi, Nedungunam, Kolappalur, Nammiyampattu, Puliyur.
Safe (<70%)	17	Arni, Sathyavijayanagaram, Vadathandalam, Vakkadai, Cheyyar, Thethurai, Natteri, Perungattur, Vembakkam, Dusi, Anakavoor, Devikapuram, Mandakolathur, T.V.Malai (North), T.V.Malai (South), Veraiyur, Kadaladi.
Others (Poor & Saline)	-	
Total	**54**	

6. Report on Performance - Holistic Environmental and Agriculture Development (HEAD) Project

The HEAD Project is a strategic initiative aimed at enhancing natural resource management in two blocks within the Krishnagiri and Tiruvannamalai districts. Covering 3,760.34 hectares across the Beemandapalli and Thazhaiyuthu clusters, the project

[2] *Source: TWAD report 2023, Tiruvannamalai District profile on water level. https://www.twadboard.tn.gov.in/content/tiruvannamalai*

benefits 10,972 individuals from 2,756 households. Its core objectives include conserving and enhancing natural resources, promoting sustainable agriculture, increasing green cover through plantations, and strengthening livelihood activities. The project is structured around five key components.

Table 3 Major components of the HEAD Project

S.No	Major Components	Infrastructure created /Activities
1	Water resource development	• Farm Pond • Farm pond inlet • Village pond renovation • Percolation pond • Channel clearance • Masonry Check Dam (MCD) • Repairs of MCD • Sunken pits
2	Soil and Moisture Conservation	• Field bund • Field bund pipe outlet • Vettiver slips. • Loose Rock Check Dam
3	Plantation and Sustainable Agriculture	• Agro Forestry • Agro Horticulture • Fodder Development • Home Garden • Vegetable Pandhal
4	Training and Demonstration	• Orientation training for villagers • Agriculture technical training • Health Camps for livestock • Exposure visits and • Demonstrations
5	Livelihood Support for Women	• Back yard Poultry • Dairy cattle unit • Goatery • Organic farming production unit

By integrating natural resource management with capacity building and livelihood enhancement, particularly focusing on agriculture and women's empowerment, the project seeks to create a self-reliant ecosystem that can sustain community livelihoods while ensuring local ownership of resources. This holistic approach addresses multiple facets of rural development, from environmental sustainability to economic resilience and social equity. (*Pl refer Annexure 1 for details on cluster level beneficiaries)*

6.1. Water Resource Development

Water resource development focuses on the efficient management and utilization of water sources to ensure sustainable supply for agriculture and domestic use. Preserving water ecosystems improves environmental sustainability, which is the primary work of the HEAD project.

The following structures were implemented in both the clusters -

Farm Pond & Farm Pond Inlet: These structures are crucial for water conservation and irrigation, especially in areas with erratic rainfall or water scarcity. Farm ponds help farmers store rainwater, ensuring a reliable water source during dry periods, enhancing agricultural productivity, and reducing dependence on external water supplies. It leads to improved crop yield, better soil health, and a buffer against drought conditions.

Well (Bore well) Recharge Pit: Recharge pits are vital for replenishing groundwater levels. Over-extraction of water from bore wells can deplete aquifers, making it harder to access water. Recharge pits allow rainwater to infiltrate and recharge the underground water table, ensuring long-term water availability.

Percolation Ponds: Percolation ponds play a crucial role in water management by capturing rainwater and promoting groundwater recharge. These structures enhance the infiltration of water into the soil, improving groundwater levels and ensuring a steady water supply for farming and other needs.

Channel Clearance: Channels used for water flow, such as rivers or irrigation canals, can become clogged with silt, debris, or overgrowth, obstructing water flow. Regular channel clearance ensures that water can flow freely, preventing waterlogging and ensuring efficient irrigation.

Masonry Check Dam: Check dams are essential for controlling and storing water, especially during the monsoon. They prevent soil erosion, reduce the speed of flowing water, and increase groundwater recharge. By trapping water in smaller streams and rivers, they ensure that water is available during dry spells. Repairing and maintaining existing check dams is essential to ensure their continued functionality. Dams that are damaged or poorly maintained lose their ability to control water flow and store water, leading to inefficiency in water management. Repairs and proper maintenance of check dams restores water storage capacity, improves flood control, and protects against drought.

Sunken Pits: Sunken pits are used for storing rainwater and preventing runoff. These structures help with water conservation, especially in areas with low rainfall or irregular monsoon patterns. They also allow for soil moisture retention, benefiting crops during dry spells.

These interventions at the 2 clusters were designed to address water scarcity, improve

agricultural productivity, and promote sustainable resource management. In both the clusters , water management was a critical challenge, and these interventions directly supported the long-term resilience of farming practices, community development, and ecological sustainability.

Structures created in the 2 clusters.

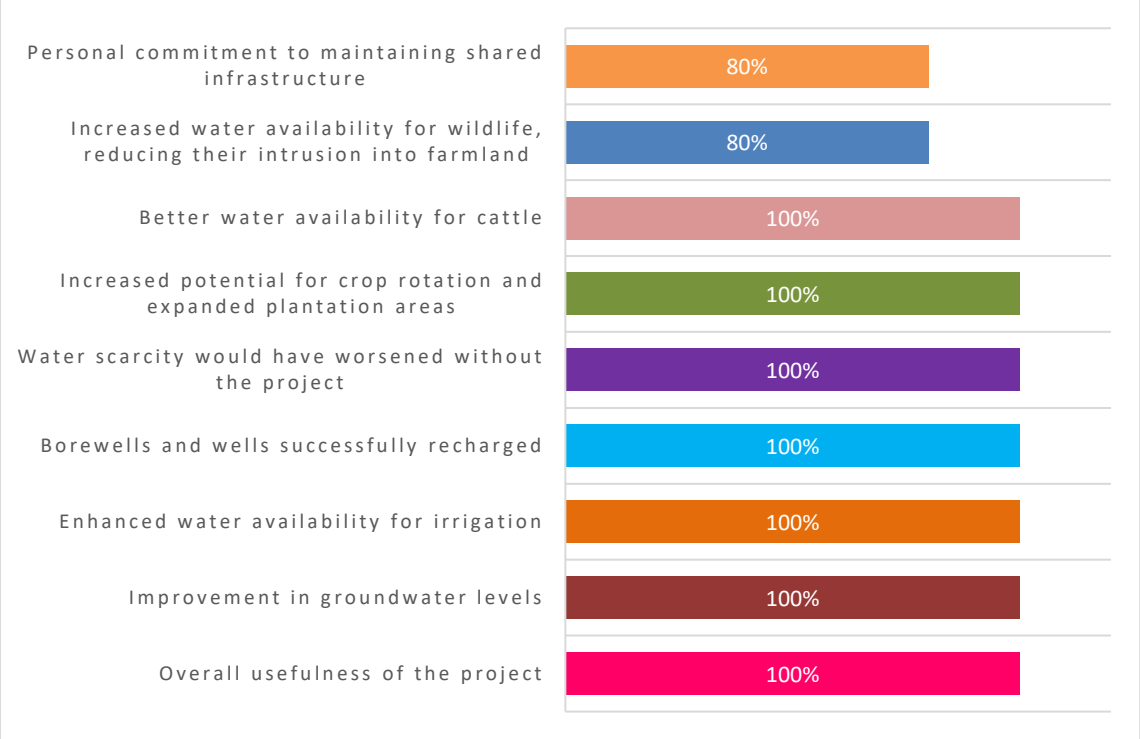
Structures created	Beemandapalli		Thazhaiyuthu		Total
	Male	Female	Male	Female	
Farm Pond	13		21	1	**35**
Farm Pond Inlet	13		21	1	**35**
Well (Bore well) recharge pit	8				**8**
Percolation pond	46	19	64	16	**145**
Channel clearance	22	8	27	13	**70**
Masonry Check Dam			50	19	**69**
Repair of MCD			36	9	**45**
Sunken Pits			6		**6**
TOTAL Structures created	**102**	**27**	**225**	**59**	**413**

The project had a positive impact, with nearly 100% of respondents acknowledging improvements in groundwater levels, irrigation, and the recharge of borewells and wells. These interventions effectively reduced water scarcity and boosted agricultural productivity, supporting crop rotation and improved water access for livestock. Although personal commitment to maintaining shared infrastructure and providing water for wildlife scored slightly lower (20%), the project's overall usefulness is widely acknowledged.

Farmer Speak.

The farm pond has raised the water levels in both my borewell and well. I also earned ₹15,000 from fish farming in the pond. Now, I'm waiting for the rains to start fish farming again.

Figure 1 : Beneficiaries feedback on TITAN-- NAF water resource development programs.



80% of the farmers are committed to maintaining the infrastructure created in their farms. All the farmers experienced better water availability in their farms and appreciated the initiative.

Farmer speak.

Our farmland is close to the forest boundary, and deer, wild boar, and porcupine frequently enter in search of water and food. We rely on dogs to help keep these animals away. Unfortunately, some people take extreme measures to protect their crops, which may be unlawful and sometimes harm animals, such as deer. I have witnessed this on occasion. The pond near the forest boundary has greatly reduced these movements into farmland, providing a helpful resource for the wildlife.

NAF has done extraordinary work. Since we had little rain this time we couldn't enjoy the fullest benefit of the project. May be if you come after monsoon the situation will be different.

6.2. Soil and Moisture Conservation

Soil and moisture conservation initiatives are critical for reshaping rural landscapes, promoting sustainable agriculture, and enhancing communities' livelihoods. These initiatives focus on improving water retention, reducing soil erosion, and ensuring the efficient use of available resources. The following structures were implemented in both the clusters-

Loose Rock Check Dams (LRCD): These dams are built using locally available materials, primarily rocks, to slow down the flow of water in small streams or rivers. By reducing water velocity, LRCDs help prevent soil erosion, capture sediment, and increase water retention in the landscape. This leads to enhanced groundwater recharge, better irrigation availability, and reduced flooding, which directly benefits farming communities. The structure also supports biodiversity by creating microhabitats and protecting downstream ecosystems.

Water collected in a new well near check dam.

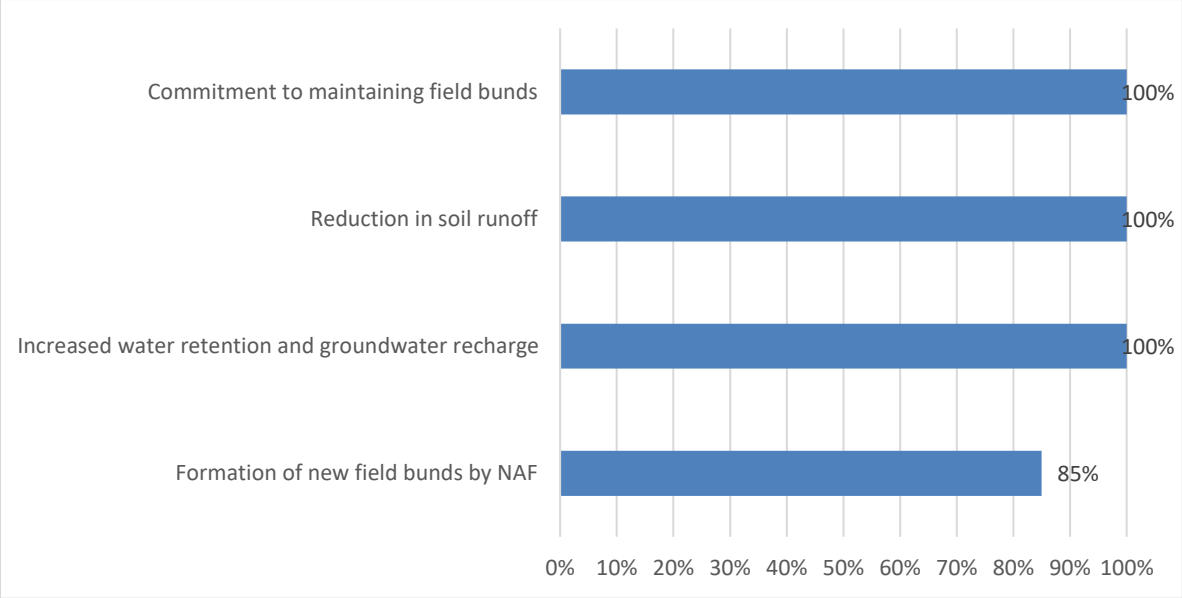
Field Bunds with Pipe Outlets: Field bunds are raised embankments constructed along the contours of the land to prevent surface runoff and retain water in the fields. When combined with pipe outlets, these bunds efficiently manage excess water, allowing it to be diverted to storage ponds or irrigation systems. This system ensures that water is conserved and evenly distributed throughout the fields, enhancing soil moisture levels, improving crop yields, and minimizing the risk of waterlogging or erosion. The bunds also reduce the impact of heavy rains, preventing damage to crops and fields.

Soil and Moisture conservation					
Structures created	Beemandapalli		Thazhaiyuthu		Total
	Male	Female	Male	Female	
Field Bund	63	63	63	63	252
Field Bund Outlet	63	63	63	63	252
Loose Rock Check Dam	5	1	12	6	24
TOTAL Structure	131	127	138	132	528

85% of the beneficiaries surveyed acknowledged NAF's support in creating their farmland's bunds. They would not have built it without their support. All the beneficiaries

experienced clear evidence of improved water retention and reduced soil erosion.

Figure 2: Soil and moisture conservation interventions by NAF-Titan



Farmer Speak.

Titan and NAF are doing remarkable work creating field bunds in farmland and we hope they remain part of our village for a longer time, continuing to support our farming community.

If NAF and Titan support continues, we will bring our next generation to farming.

The structures they have created for our village and for the individuals are of high quality and very durable. This will help our farming community to continue farming. They are continuing their work with great responsibility, our village should be forever grateful to NAF and Titan

6.3. Plantation & Sustainable Agriculture

Plantation and sustainable agriculture focus on practices that conserve natural resources, enhance soil health, and promote biodiversity. By integrating tree planting, crop diversification, and organic farming methods, these practices reduce environmental impact, improve water retention, and ensure long-term agricultural productivity, benefiting both the environment and local communities.
The following activities were implemented in both the clusters.

Plantation & Sustainable Agriculture					
Activity	Beemandapalli		Thazhaiyuthu		Total
	Male	Female	Male	Female	
Agro Forestry and Agro Horticulture	147	36	85	36	304
Fodder development	109	41	142	31	323
Home Garden	104	47	36	128	315
Vegetable Pandal	10	0	4	1	15
TOTAL Beneficiary	370	124	267	196	957

6.3 Agro forestry and Agro horticulture

Agro forestry and Agro horticulture are effective land management practices that improve land productivity, yield, and support environmental sustainability. They provide diverse resources like fodder, fruits and timber. Planting native species restores soil health and further enhances farm productivity.

Farmers were encouraged to promote Intercropping between trees with regular crops. This created additional income opportunities to the communities in Thazhaiyuthu and Beemandapalli clusters and has benefitted both their livelihoods and the environment.

Timber tree plantation in Beemandapalli cluster.

Community feedback on saplings provided by NAF.

Parameters	Responses (%)
Quality and growth of saplings distributed are very good	**92%**
Survival rate of live plants after plantation	**70%**
Belief that plantations will increase income	**95%**
Expectation that land value will increase due to plantations	**100%**

The community highly values the plantation efforts, with 92% expressing satisfaction with the saplings' quality and growth. Despite a 70% survival rate due to last year's low rainfall and subsequent water scarcity, there is strong confidence (95%) that these efforts will increase income. Furthermore, all respondents (100%) believe the plantations will enhance their land value, highlighting the long-term economic benefits of sustainable agriculture.

Story of Hope

"I've been farming on a small piece of land for the past 60 years, growing paddy and groundnuts to support my family. Now, my son has taken over the farming on that land. In 2005-06, the Tamil Nadu state government provided free land to marginalized farmers, and I received 1.5 acres through that scheme. This land is located near a hilly slope, and I don't have the financial means to clear it and make it suitable for farming. Situated at the edge of the forest with no water source, farming there has been difficult. The NAF team suggested planting neem trees, which are drought-resistant and not disturbed by animals. I agreed and planted 200 saplings. NAF supported me by providing the saplings and assisting with digging the holes using machinery at no cost. The saplings are thriving, and with some good rainfall this year, I expect them to grow even better. Thanks to NAF, I now have an asset for the next generation." ***-Mr.Rajendran from Thazhaiyuthu***

Fodder Development

The Fodder Development Initiative focuses on enhancing livestock health and productivity through the cultivation of high-quality, nutritious fodder. This initiative promotes efficient feeding that minimizes waste and maximizes nutrient absorption. It leads to increased milk production and livestock productivity.

Farmer speak.

I have an azola pit now. Agathi and fodder crops were given by NAF. My cows yield more milk than before, fat content in the milk has also increased.

Pic 1: CO38 Fodder and Agathi fodder crop

Table 1: Impact of Quality Fodder on Cattle Nutrition and Milk Production

Fodder Aspect	Outcome	Beneficiaries' responses
Quality of Seeds and Stem	Germination Rate	**100%**
Cattle Feeding Efficiency	Nutrient Absorption (No Wastage)	**100%**
Increase in Milk Production	Milk Production Increase	**100%**

100% of beneficiaries confirmed a high germination rate, providing healthy fodder for cattle. The cattle feed efficiently with minimal wastage, ensuring complete nutrient absorption, which leads to increased milk production. These results highlight the positive impact of quality food on improving livestock health and productivity.

Home garden: The home garden initiative aims to provide villagers with nutritious, chemical-free vegetables and fruits. This reduces their expenditure on local markets. Beneficiaries from the Thazhaiyuthu and Beemandapalli clusters received various seeds, including tomato, brinjal, chili, ladies' finger, bitter gourd, cluster beans, snake gourd, calabash, drumstick, lettuce, red spinach, agathi, pumpkin, and papaya. After planting these in their backyards, the villagers harvested healthy vegetables for their households. This activity promotes self-sufficiency and better health for the community.

Story of Hope

"With support from NAF and Titan, I began organic farming, which has greatly improved my life. Through their training, I learned to make vermicompost and azolla, using dung from my three cows. NAF provided a vermicompost pit bag, making the process easier and efficient, turning the dung into rich compost for my vegetable garden. With this compost and seeds from NAF, I grow a variety of vegetables for my family without relying on artificial fertilizers. The yield has been excellent; my crops are healthy, and there's enough to share with relatives. Eating fresh, chemical-free food has boosted our health, and it feels rewarding to grow it all in my land. Now, after a successful harvest, I'm preparing my field for the next planting season. Organic farming has truly brought health and sustainability to my family."

-Mrs. Deepa, Attavadi village

Vegetable Pandal:

The introduction of a cost-effective pandal system is more accessible to farmers. The pandal system, traditionally used to support crops like bitter gourd, ribbed gourd, snake gourd, and lablab. During the reporting year, 15 vegetable pandals were installed in the Thazhaiyuthu and Beemandapalli clusters.

Additionally, soil tests, micronutrients, bio fertilizers solar pest control units were also distributed to the farmer to increase productivity. These pandals have increased vegetable production in the project areas, promoting sustainable farming and improving crop yields for the local community.

Pic 2: Pandal Vegetable installed in Attravadi.

Farmer Speak.

Vegetable Pandal has doubled my profit than before, the workload has also been reduced as maintaining the plants is easier in a pandal. Now me and my wife are taking care of our farm.

6.4 Livelihood for women

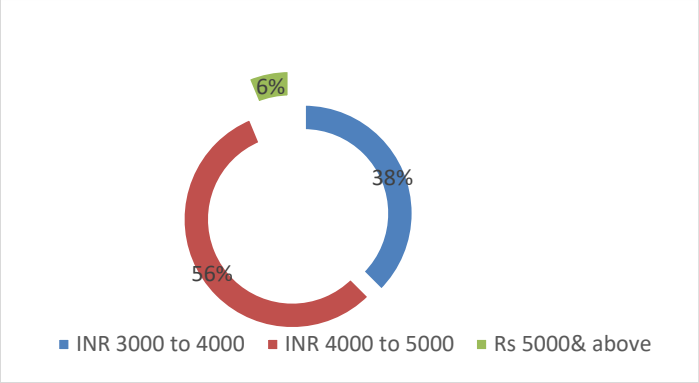
To promote rural livelihood for rural women in the two clusters the following 3 different livelihood opportunities were imparted. 152 women launched new livelihoods.

Livelihood	Beemandapalli	Thazhaiyuthu	Total
Dairy cattle unit	53	32	85
Backyard Poultry	20	25	45
Goat Rearing	20	2	22
Total Women	**93**	**59**	**152**

Dairy farming

Dairy farming has emerged as a better livelihood opportunity for women in the project areas. This initiative primarily targets landless women, empowering them to take charge of their economic futures. This approach highlights the importance of inclusive economic activities in enhancing the livelihoods of vulnerable groups.

Figure 3: ***Monthly Income from Diary farming.***



Approximately 56.25% of women beneficiaries reported earning Rs 4,000 to 5,000 monthly, boosting their financial stability. Another 37.5% earn between Rs 3,000 and 4,000, while nearly 6% have generated over Rs 6,000.

The chart below shows that income from livestock is primarily directed toward essential needs: 93% goes to daily expenses and loan repayment, and 90% supports children's education and medical costs, reflecting a strong focus on family well-being. Additionally,

85% of this income is invested in agricultural activities, underscoring its importance in sustaining farming operations.

Figure 4: Expenses incurred by beneficiaries

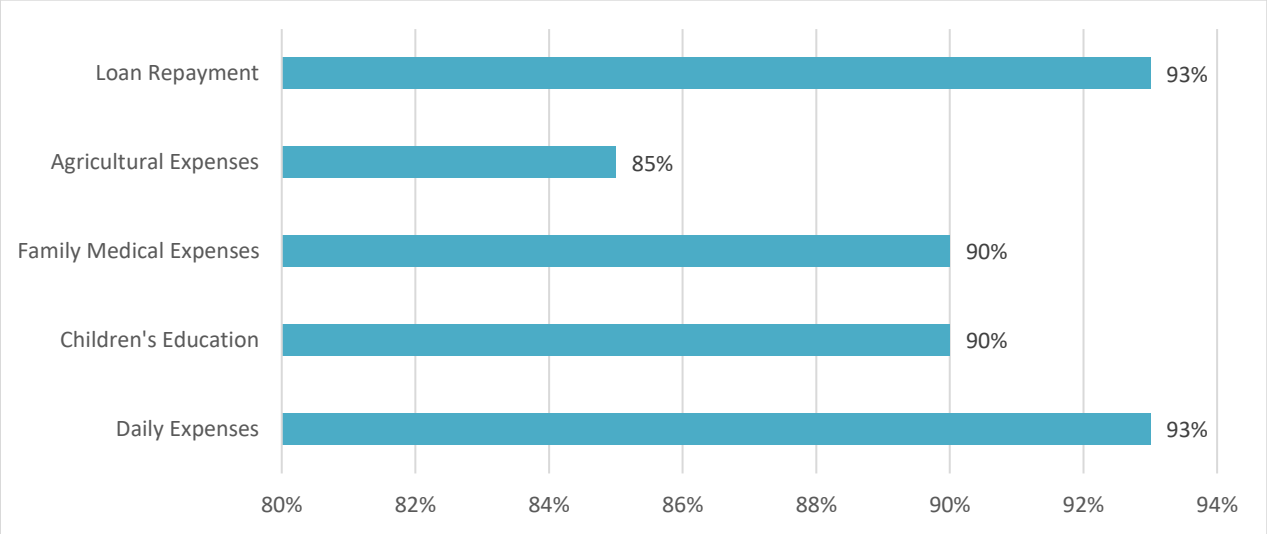
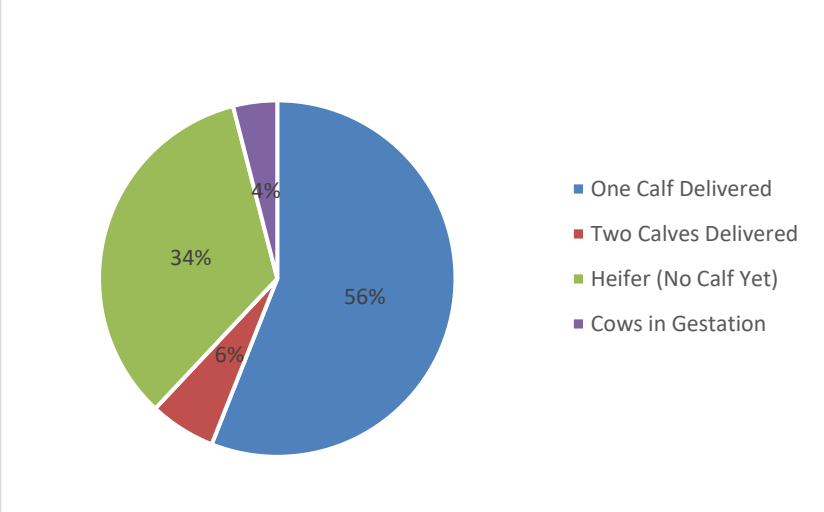


Figure 5: Beneficiaries responses on livestock productivity.



85 women were given cows as part of the HEAD project. The number of calves delivered by these cows demonstrates a positive impact on livestock productivity. Among respondents, 56% reported their cows have delivered one calf, and 6% reported two calves. Notably, 34% have heifers yet to calve, indicating potential for future productivity increases. Additionally, 4% of cows are currently pregnant, showing ongoing reproductive success. These findings highlight the program's effectiveness in boosting livestock productivity and supporting the livelihoods of participating farmers.

Farmer speak.

The number of women involved in cattle farming has grown in our village. NAF has provided loans for purchasing cows, organized veterinary camps, supplied fodder crops, and offered training sessions. This support has empowered them, and now more women are motivated to start their own dairy units –

Neethimohan, Dairy farming beneficiaries' husband

Table 8: Cow Dung usage

S.no	Usage	%	Response from women
1	Utilized on own farm	**84%**	Improvement in soil fertility and crop yield
2	Distributed to other farmers and friends	**16%**	Enhanced access to natural manure, sustainable farming practices.

Approximately 84% of cow dung on the farm of the women is used to enhance soil fertility and significantly boost crop yields, supporting agricultural self-sufficiency. The remaining 16% was shared with neighboring farmers, providing valuable organic manure that promotes sustainable farming beyond the farm. Beneficiaries reported improved crop yields, highlighting the value of this resource. This approach not only strengthens individual productivity but also fosters community resilience through shared, sustainable practices.

Farmer Speak.

We produce our own fertilizers using cow dung, goat dung and other organic materials. I have a vermicompost pit and drums for producing Panchagavya. This has saved me more money.

Backyard Poultry

ackyard poultry farming has been granted only to women in the villages, prioritizing widows, to help meet the nutritional needs of all participating households. Every beneficiary agreed that their need for eggs and meat was fully met, enabling families to provide a healthy, balanced diet to their children with home-produced eggs and meat. This initiative reduces reliance on purchased food and boosts household nutrition. Additionally, some beneficiaries have turned backyard poultry into a small business within their village, selling eggs and meat locally.

Story of Hope

Kalavathi, around fifty years old and hailing from Attravadi village, is a single mother and a beneficiary of the backyard poultry initiative. She previously worked as a farm laborer and owns a small plot of land. After receiving poultry support from NAF, she began selling eggs to local villagers, making a living from her small poultry operation. Her son, Vinoth, worked in a nearby town and would visit her during holidays. A year ago, after taking 15 days off due to health issues, Vinoth spent time at home and observed his mother's involvement in the poultry initiative, supported by NAF. Inspired by her success and learning about NAF's efforts, Vinoth decided to invest his own money to expand the flock. He started a country chicken farm with 80 chickens and sought training from NAF in Azolla cultivation and vermicomposting. With this new knowledge, Vinoth grew his flock, started selling both eggs and meat, and began generating a steady income. Every Sunday, he sells chicken meat in the village. Recognizing the nutritional benefits of Azolla for his chickens, he is now constructing a larger concrete pit to cultivate it, further boosting the success of his farm. Kalavathi, with Vinoth's help, now enjoys a sustainable livelihood, supporting her family and contributing to the farm's success.

Goat rearing

The goat-rearing initiative, funded through a rotational scheme, has notably boosted household income for participants. Among respondents, 75% reported a monthly increase of ₹5,000, while 25% saw an increase of ₹2,000. Nearly 95% of beneficiaries acknowledged experiencing significant financial growth. In terms of livestock productivity, 50% reported that their NAF-supported goat produced 3 kids, and 25% reported 4 kids, supporting long-term income generation and food security for the community.

Farmer Speak.

Due to less rainfall and lower water availability farming was a bigger challenge for some farmers who have land in higher area in our village. For them goat rearing has being a great support. The income has become a considerable part of their family – farmer, Porasampattu.

6.4. Training and Orientation Programs

The orientation training held in the Beemandapalli and Thazhaiyuthu clusters between June 2023 and March 2024 covered several key topics, including an explanation of the agricultural component and overall aspects of the project, focusing on its purpose and expected impacts. The training also included discussions on the effects of Field Level Demonstrations (FLD), updates on agricultural activities and plans for the upcoming year in the villages, and knowledge sharing about traditional seed varieties and value addition.

Training and demonstration					
Activity	Beemandapalli		Thazhaiyuthu		Total
	Male	Female	Male	Female	
Orientation Training for Villagers/ CBOs	106	34	73	31	244
Agriculture Technical Training	348	111	265	130	854
Health camps for Livestock	107	59	76	33	275
Exposure Visits	19	5	44	27	95
Demonstration	15	0	15	0	30
TOTAL Beneficiary	595	209	473	221	1498

A total of 244 beneficiaries participated in the Orientation training, with 106 males and 34 females in the Beemandapalli cluster, and 104 beneficiaries, including 73 males and 31 females, in the Thazhaiyuthu cluster.

The topics in the Orientation training explained about

- Agri component in the project & overall components of the project
- Purpose of each component in this project
- Impacts of agri components
- Impacts of Filed Level Demonstration
- Traditional Crop variety
- Value addition of crops

The training has helped farmers become better informed and better prepared to implement effective agricultural practices in their communities. Its goal was to improve the understanding and application of both traditional and modern agricultural methods in the area.

Field Level Demonstration (FLD)

NAF introduced scientific methods to help farmers assess their soil characteristics and

provided bio-fertilizers, micronutrients, and organic fertilizers based on soil test results, improving soil fertility. Pest control tools, including yellow sticky traps, solar light traps, pheromone traps, and neem-based liquid, were also supplied, to boost soil productivity. A total of 30 farmers from the Beemandapalli and Thazhaiyuthu clusters benefited from this initiative.

Table 7 Beneficiaries who received the FLD inputs.

FLD Inputs	Beneficiaries
Soil Test Report	30
Bio Fertilizers	30
Micronutrients	30
Yellow Sticky Trap	30
Neem Ban Liquid 500ml	30
Pheromone Trap	30
Laspra 500ml	30
Solar Light Trap	30

Farmer Speak.

NAF has done a soil test for my farm and suggested micronutrients for half acre paddy crop in FLD activity. After doing this my cost got reduced, and production has also increased compared to my previous year – R.Vijayakumar

Exposure Visits

The exposure visits to the Beemandapalli cluster, held on February 15 and August 16, 2024, engaged 24 participants (19 males and 5 females) in agricultural development topics like soil health, organic formulations, cattle feed business, and bee farming. Participants visited KVK Sandhiyur, Mecheri FPO, and AO Honeybee Farm in Salem as part of the program. In the Thazhaiyuthu cluster, exposure visits took place across three events, involving a total of 71 participants, with 44 males (62%) and 27 females (38%). These visits, held between March 2023 and August 2024, focused on essential themes such as soil health, organic farming, value addition, and livestock management at various agricultural and research institutions.

Farmer Speak.

Many of us have been in the village for years, but we have not visited any organisation to learn anything. We are very happy that we learned farming and allied activities at this age. Some of our villagers have started sericulture units in our village, some of them having bee hives, vermicompost azola fodder etc. The trainings and Exposure visits have stepped up our farming community.

The program aimed to improve farming efficiency through practical, sustainable agricultural practices while promoting eco-friendly methods for long-term benefits. The representation of women highlights an effort to ensure inclusivity in updating farming practices and advancing the agricultural sector.

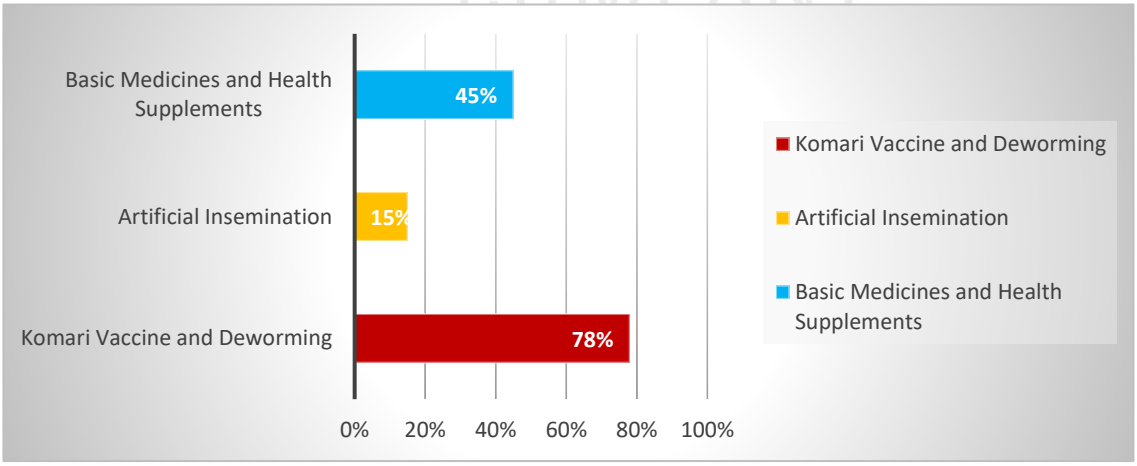
Health camps for livestock

The livestock health camps have greatly benefited the community by enhancing animal care. These camps focused on disease prevention through vaccinations and deworming treatments, while also offering reproductive health services to improve herd quality. In addition to these services, basic medicines and health supplements were distributed to further support livestock well-being.

Farmer Speak.

The health camp has been a great support in helping us treat our livestock right here in our village. Previously, we had to spend at least half a day traveling to the nearby veterinary hospital. They also provided valuable advice on insemination and symptoms of various diseases.

Figure 6: Reach of health camps for livestock.



The livestock health camps provided valuable medical support, with 78% of the livestock receiving Komari vaccines and deworming treatments, highlighting a strong focus on disease prevention. Artificial insemination services were used by 15%, indicating moderate adoption of reproductive health interventions. Basic medicines and health supplements were provided to 45% of the livestock, reflecting a solid effort in general healthcare. Overall, this approach demonstrates a comprehensive health strategy with an emphasis on vaccination and deworming.

7. Evaluation of Project based on REESS Framework

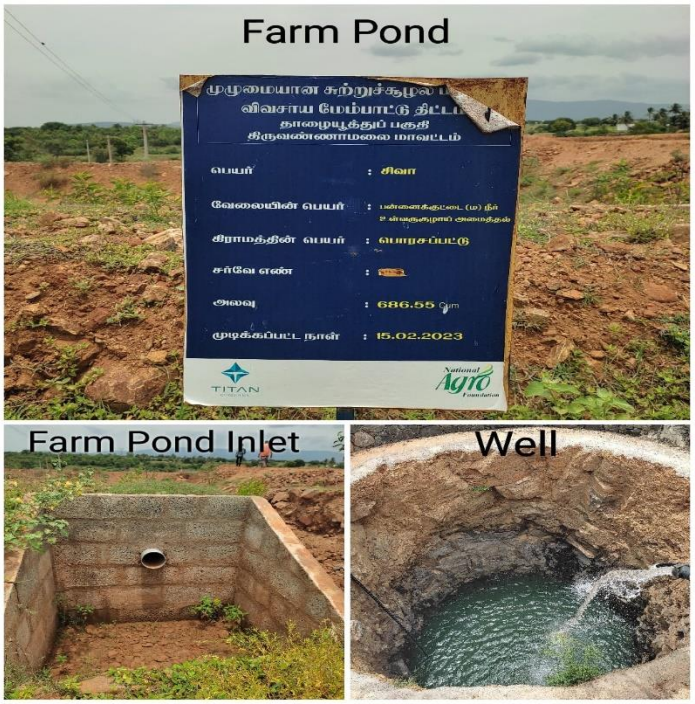
The HEAD project was evaluated using the REESS framework, which measures performance based on Relevance, Effectiveness, Efficiency, Social Impact, and Sustainability.

7.1. Relevance

The HEAD projects were designed to address the issues of water scarcity, agricultural productivity, and livelihood challenges in Beemandapalli cluster and Thazhaiyuthu cluster. The decision to select this block for the water resource development project is highly relevant, as it aligns with the need for water resource management in the area.

Groundwater data from government sources classify this block as an Over-exploited region, indicating high stress on groundwater levels. Initiatives like percolation ponds, check dams, farm ponds, and village pond renovations were highly relevant as they directly addressed community and environmental needs for water retention, groundwater recharge, improved water availability and soil conservation.

These structures are important in capturing and storing rainwater, recharging groundwater, and supporting agriculture during dry seasons. The project's emphasis on modern agricultural practices, such as soil testing, micronutrient supplementation, bio-fertilizers, organic fertilizers, solar insect traps, yellow sticky pads, and Neem-based pest control—was instrumental in boosting crop yields and nurture sustainable farming.



Pic 5: NRM activities carried out by TITAN-NAF

The community's heavy reliance on agriculture as a primary livelihood highlights the need for initiatives that improve agricultural sustainability and productivity. Despite efforts in agroforestry and agro-horticulture, soil degradation and erosion continue to impact agricultural yields.

Additionally, there was a need for better livestock care, with fodder development and veterinary camps essential for addressing health issues that affect farm productivity. The community also faced a knowledge gap in modern and indigenous farming techniques, which is being addressed through training programs and exposure visits.

There were limited income-generating activities like dairy units, poultry, and goat farming, for the women in the region. The women were open to learn, but did not have proper opportunities or training to start small businesses.

Story of Hope

"I've been farming with my father since a young age. Currently, I cultivate on 6 acres, up from 2 acres in the past. We used to farm seasonally and raise cattle and goats year-round. When NAF came to our village, they held a meeting with local farmers, introducing their proposed initiatives and the impact they aimed to create. I felt compelled to follow their guidance to bring change to farming in my village.

I am one of the farmers who benefited from NAF's support. With their help, I rapidly developed our farm. Previously, we focused on seasonal crops like groundnuts and millet, with occasional paddy cultivation. Now, I grow paddy, sugarcane, and various vegetables thanks to increased water availability for irrigation. About a year and a half ago, I dug a 60-foot well that now holds 40 feet of water. With NAF's support, I also added a farm pond and an inlet next to the well, improving water percolation and maintaining water levels.

Through the home garden program, I received seeds for vegetables and other crops, including native toor dal. I planned to produce seeds from this dal, and after completing two crop rotations, I now have enough to cover 8 cents of land. This 8-cent crop can yield enough seeds for 2 acres next season. Seeds is an asset for a farmer, and now I don't need to rely on others or spend extra money on Toor dal seeds.

I also received CO38 fodder stems, suitable for planting on 5 cents of land to feed my cattle. Over time, I expanded this, and now the fodder covers 40 cents of my farm, supporting 10 cows and 15 goats. This fodder has become a valuable asset for my farm. Additionally, I received tree saplings that are growing well. I'm deeply grateful to the National Agro Foundation and Titan for their support."

- Mr. Siva, 50 years old, Porasampattu Village

7.2. Effectiveness

Overall, water resource management in the project area has led to significant improvements in the groundwater table, enhancing irrigation capabilities and boosting agricultural productivity. Groundwater levels rose from 2.3 to 4.2 meters in summer and from 7.8 to 8.9 meters in the monsoon after watershed interventions were implemented. Structures such as check dams, farm ponds, and percolation ponds have effectively captured rainfall, reduced runoff, and raised water tables, extending irrigation availability. Additionally, effective channel clearances have minimized flood risks and ensured proper drainage during the monsoon, preventing waterlogging and crop damage in nearby fields. These efforts have also improved green cover and biodiversity in the area.

Soil tests conducted by NAF have provided valuable insights into soil conditions, allowing farmers to make informed decisions regarding nutrient and fertilizer applications. The use of micronutrients, bio-fertilizers, and organic fertilizers has enhanced both the quality and quantity of crop yields. Solar pest traps, yellow sticky traps, pheromone traps, and neem-based liquid have reduced the need for insecticides, lowering costs, labor, and improving environmental conditions and insect biodiversity.

Increasing the height of field bunds has helped retain water and prevent soil erosion. The distribution of fodder kits has led to increased milk production and reduced grazing time for livestock. Training programs and exposure visits have enhanced the practical knowledge and skills of participants, leading to better farm management and increased productivity. These initiatives have encouraged the adoption of sustainable agricultural practices, reducing dependency on chemical inputs and fostering environmental stewardship.

Self-Help Group members who participated in exposure visits gained knowledge in self-employment opportunities, cattle management, farm units, bee farming, and value addition of agricultural products. Some have already started applying these skills on a small scale, generating income and increasing self-motivation.

Planting trees along bund structures has effectively mitigated soil erosion and strengthened the durability and stability of these interventions.

Story of hope

"My husband is a farmer, and our two sons are studying engineering. In our village, NAF has been organizing training programs and industrial visits for farmers. I had the opportunity to visit a sericulture unit, where I learned about silkworm cultivation. The process deeply inspired me, and with information on government support and subsidies in this field, a new spark ignited within me. Guided by NAF, I am now setting up my own silkworm production unit and have planted mulberry trees, the essential food for silkworms, on 1.5 acres of land.

Despite facing obstacles and discouragement, I stand strong, supported and motivated by NAF's guidance. I am especially grateful to Mr. Dinesh from NAF for his invaluable support. Additional financial assistance from NAF would be highly beneficial as I move forward with this endeavour." **-Mrs. Jothilakshmi from Thazhaiyuthu**

7.3. Efficiency

The allocation of resources for key interventions, including water management, agricultural improvements, income generation programs (IGPs), and adherence to timelines, was commendable.

Interventions such as the construction of check dams and percolation tanks were completed on schedule, effectively addressing immediate water scarcity issues. Agricultural improvements, including soil testing, micronutrient application, and the use of organic fertilizers, were efficiently implemented, resulting in noticeable improvements in crop yields and soil health.

The planting of 21,000 saplings was well-maintained, contributing to increased green cover.
The efficient distribution of resources, such as bio-fertilizers, seeds, and saplings, along with timely training sessions, exposure visits, and field demonstrations, facilitated the widespread adoption of sustainable agricultural practices.

Programs were tailored to meet the specific needs of dryland farmers. Women-focused initiatives, including cattle units, goat farming, and backyard poultry, were implemented to maximize household income without disrupting their regular work activities.

Farmer speak.

We had been requesting the local panchayat for a check dam for many years, but the project was never approved due to lack of funds. NAF has now built a check dam near the old one, and you can clearly see the difference in both quality and durability. If this project had been handled by other contractors, the cost would have been three times higher, and the quality would likely have been questionable.

7.4. Sustainability

The HEAD project demonstrates a strong commitment to sustainability through community engagement, capacity building, institutional support, monitoring and evaluation, and adaptive management. These strategies significantly enhance the likelihood of the project's long-term success and ensure ongoing benefits for the target communities.

The project prioritizes infrastructure sustainability by constructing durable, low-maintenance water management systems, such as check dams, percolation tanks, sunken ponds, and field bunds, which contribute to groundwater recharge and soil

conservation long after the project's completion. Agroforestry initiatives, including the planting of over 21,000 saplings, offer lasting environmental benefits by enhancing green cover and reducing soil erosion.

The promotion of biofertilizers, organic fertilizers, and solar-powered pest traps reduces the reliance on chemical inputs, encourages healthier crops, and contributes to a cleaner environment. Capacity-building programs in sustainable agriculture, livestock management, and small business skills empower communities to manage resources independently, fostering local expertise and reducing future dependence on external support.

The project also focuses on women's economic empowerment through Self-Help Groups (SHGs) and livelihood programs, which strengthen family resilience and local economic stability. SHG members actively engage in income-generating activities that benefit the broader community.

The emphasis on community-led maintenance of structures such as bunds and ponds ensure their sustained functionality. By encouraging participation from planning through to implementation, the project has fostered a sense of ownership, making community members more likely to maintain the structures and practices in the future.

The support from villagers is immense. they proactively engage themselves in getting permission from government officials and local panchayat members to implement NAF's projects. The villagers will stand with us till the work is over. They understand the impact we have created within their community through our work – ***Guru NAF Coordinator***

7.5 Social Impact

The project has made a significant social impact, enhancing water availability, livelihoods, food security, gender empowerment, and environmental quality.

Increased water resources through farm ponds, village ponds, and percolation tanks have alleviated water scarcity in the Beemandapalli and Thazhaiyuthu clusters, directly benefiting farmers. The improved water availability has enabled crop rotation and multi-cropping, which has enhanced food security and stabilized farmers' incomes. Soil and water conservation measures have further boosted agricultural productivity by improving soil fertility and resulting in higher yields.

The large-scale tree planting initiative has contributed to healthier soil ecosystems, increased biodiversity, and mitigated soil erosion. This environmental effort has supported sustainable agriculture and ecological balance in the region.

Training programs and exposure visits have equipped farmers with advanced skills,

enhancing farm management, boosting productivity, and strengthening community bonds. Women, in particular, have benefited from opportunities for financial independence, which has improved their economic status and involvement in community development. Nearly 100% of women beneficiaries expressed satisfaction with the nutritional benefits of backyard poultry, significantly enhancing family welfare.

The training and exposure visits also empowered women with knowledge in organic farming, small business management, and self-employment opportunities, promoting social equity. Livestock health camps have improved animal health and productivity, directly enhancing household incomes by reducing mortality and boosting productivity. Additionally, the home garden initiative has improved household access to nutritious vegetables and fruits, reducing food expenses and increasing self-sufficiency.

Overall, the project has improved community welfare by promoting sustainable agricultural practices, empowering women, and fostering environmental sustainability.

Thanks to NAF's guidance, I've adopted a profitable farming method. I grow gourd varieties on a pandal, with brinjal and tomato plants below the climbers. This approach is highly efficient, allowing me to harvest around 300 kg of vegetables in a small space. I also save seeds from these plants for the next season, which cuts down costs. Additionally, NAF provided a honey box, allowing me to collect 0.5 to 1 liter of honey every two months for home use. Farming has now become rewarding and sustainable for me."- **Mr. Jai Shankar from Thazhaiyuthu**

The plantation activities undertaken as part of the project further improve the environment by increasing green cover, which in turn boosts air quality by absorbing CO_2, reducing dust, and enhancing the local climate. These plants also serve as habitats for a wide variety of species, promoting biodiversity in the region. Through these efforts, the project helps restore natural ecosystems and supports wildlife conservation.

Another significant environmental impact of the HEAD project is the reduction in chemical use. By promoting natural pest control methods, biofertilizers, and organic fertilizers, the project helps preserve the quality of local water sources, prevent soil degradation, and support a more biodiverse range of plants and animals. These practices reduce the harmful effects of conventional chemical inputs on the environment, leading to healthier ecosystems and more sustainable farming practices.

The adoption of these environmentally friendly agricultural techniques has enriched soil health, which in turn increases crop resilience and yield, without degrading the land. This holistic approach not only improves the productivity of farms but also helps restore the ecological balance, enabling farmers to continue producing food sustainably without exhausting their natural resources.

Furthermore, the combined efforts of the HEAD project contribute to carbon sequestration, playing an important role in mitigating climate change. By promoting

sustainable land management practices, reducing the carbon footprint of farming, and enhancing carbon storage in soils and plants, the project helps offset emissions and contributes to broader climate goals.

All the initiatives of the HEAD project promote a balanced ecosystem by improving air and water quality, fostering biodiversity, and supporting sustainable agricultural practices. These efforts provide significant environmental benefits that not only improve the health of the ecosystem but also ensure the long-term sustainability of the communities that depend on it for their livelihoods.

Story of Change

I am Kannagi, and I live with my family in Porasampattu. Our family has been living on the same land for five generations, but for many years, farming was not possible due to severe water scarcity. We own two acres of land, but instead of growing crops, we could only use it for grazing, rearing our two cows and four goats. For our livelihood, my husband, my sons, and I would go for daily wage work in nearby towns, while my mother-in-law took care of the livestock at home.

Then came National Agro Foundation (NAF), which transformed our situation. They desilted and deepened the pond near our land, a change that brought unbelievable results. Suddenly, our groundwater levels rose significantly, and this increased water availability allowed us to install a bore well. For the first time in years, we were able to farm on our land. We began plowing our fields and planting paddy, something we had not been able to do for a long time. What once seemed like dry, barren land was now being transformed into productive farmland.

The impact of this change did not stop with just our family. Nearly thirty families in our village, all of them our relatives, began farming as well, transforming their once barren land into fertile fields. Before the intervention, rainwater would run off downhill, leaving us with no hope for agriculture. Now, we see lush green fields where once there were only weeds and grass. This support has completely transformed the way we work and live, making farming our primary occupation once again.

What NAF has done for us is more than just help with water; it has restored hope and created new opportunities for my family and our village. This intervention has not only given us the means to farm but has also brought us together as a community, united by the transformation of our land and the promise of a more sustainable future.

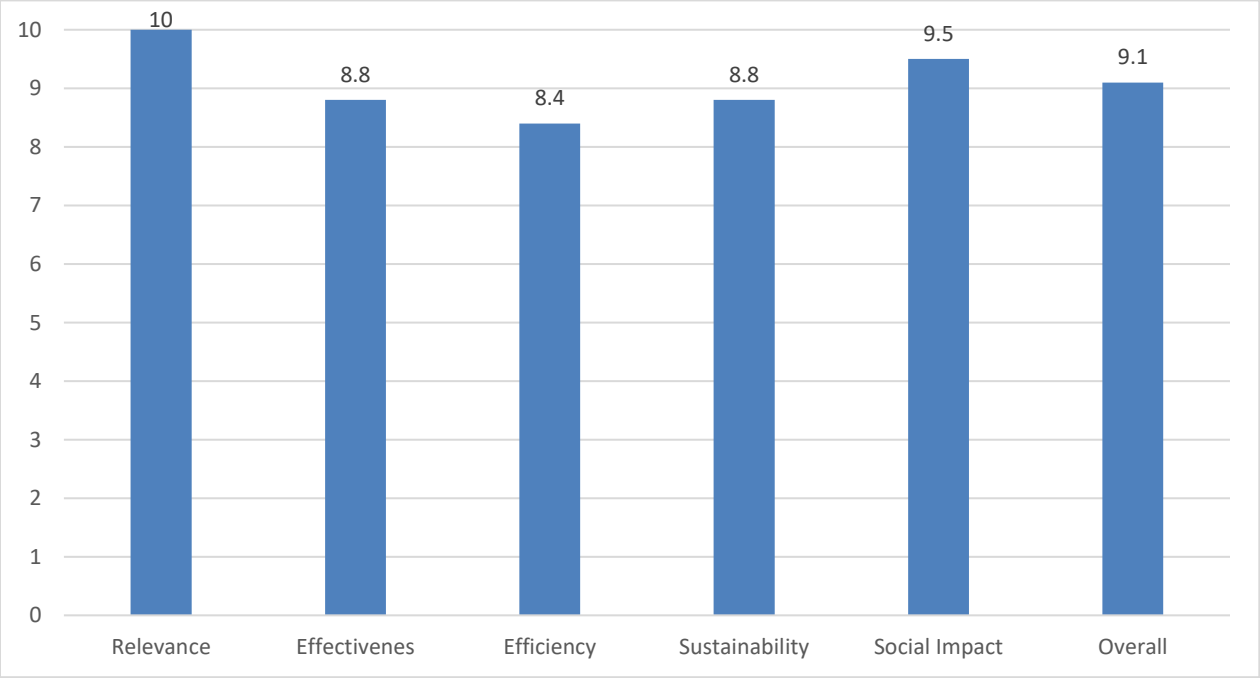
8. REESS Ratings

Category	Indicators	Ratings	Average
Relevance	Groundwater level classification	5	5
	Field Level Demonstration (soil testing, micronutrients, organic fertilizers)	5	
	Number of saplings planted (21000)	5	
	Relevance to community's dependence on agriculture and livestock	5	
	Home garden and loan for livestock	5	
	Empowering farmers with knowledge about traditional modern farming	5	
Effectiveness	Groundwater rise	5	4.4
	Reduced soil erosion and decreased siltation	5	
	Increased yields due to the use of micronutrients, organic fertilizers	4	
	Health camp for livestock	4	
	Knowledge acquisition among farmers	4	
Efficiency	Timely execution of interventions such as check dams, sapling planting, fodder development and organic manure production	5	4.2
	Efficient processes for soil testing, micronutrient use, and fertilizer application	4.5	
	Quick organization and high participation in veterinary camps,	4.5	
	Loan given for cattle	5	
	Backyard Poultry	2	
Social Impact	Improved water availability due to water storage structures, supporting resilient farming practices	5	4.75
	Reduced reliance on harmful chemicals, with ecofriendly inputs enhancing crop yields and farmer incomes	4.5	
	Cattle increasing productivity, improving livestock health, and reducing farmer workload	4.5	

	Financial independence for women through income generation programs, contributing to household and community development	5	

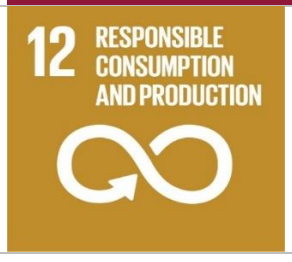
Category	Indicators	Ratings	Average
Sustainability	Low maintenance water structures (e.g., check dams, farm ponds, bunds) designed for long term functionality	5	4.4
	Local villagers and authorities maintaining water management systems with technical support from NAF	4	
	Women's involvement in income generation programs creating diverse income streams	5	
	Agroforestry initiatives (21000 trees) and water conservation structures promoting ecological balance	4	
	Continued benefits from income generation programs promoting community wellbeing and implementing new agri practices will improve sustainable farming	4	

Overall REESS Ratings



9. SDG Alignment to the Project

The Project aligns with 9 United Nations Sustainable Development Goals (SDGs), which includes.

		The projects have made a significant impact by providing women with financial independence through various income-generating activities, directly reducing poverty and enhancing economic stability within the communities. .
		By promoting advanced farming techniques and sustainable agricultural practices, crop yields have increased, improving food security and alleviating hunger while boosting nutritional outcomes
		Income generation programs and capacity-building initiatives have empowered women, fostered gender equality and increased their participation in both economic and community development activities. .
		The construction of sustainable water sources ensures a reliable supply of clean water, addressing sanitation needs and reducing contamination risks, thus enhancing public health and sanitation.
		Training programs and income-generating activities have created job opportunities, promoted economic growth, and supported decent work, boosting local economies.
		The focus on organic fertilizers and sustainable agricultural practices reduces reliance on harmful chemicals, encouraging responsible production methods that contribute to sustainable consumption and resource management.

		The emphasis on rainwater harvesting, soil conservation, and tree planting enhances climate resilience and supports environmental sustainability, aligning with climate action goals.
		The extensive tree planting and soil conservation efforts also improve local biodiversity and ecosystem health, promoting sustainable land use while preventing soil degradation.
		The success of these projects is largely due to the collaborative efforts of local communities, government agencies, and other stakeholders. These partnerships are crucial for implementing, sustaining, and scaling up the initiatives, demonstrating the power of cooperation in achieving the Sustainable Development Goals

10. Recommendations

a. **Providing clean drinking water using Reverse Osmosis (RO) Technique**: Ensuring access to clean drinking water is a crucial public health objective, especially in areas like Beemandapalli cluster, where natural groundwater contains high fluoride levels. The implementation of the Reverse Osmosis (RO) plant can remove harmful fluoride content, significantly improving the health of the community by reducing fluoride-related illnesses. This intervention would not only provide safe drinking water but also contribute to the overall well-being of residents, promoting long-term health improvements and preventing diseases such as dental and skeletal fluorosis.

b. **Health camps to address Fluoride-Related Illnesses**: Periodical health camps should be organized in Beemandapalli to specifically address health issues caused by high fluoride levels in the drinking water. These camps would offer screenings, fluoride-related health education, and treatments for affected individuals. Additionally, providing access to specialists who can diagnose and manage fluoride toxicity could help mitigate the long-term health risks that come from consuming contaminated water.

c. **General health camps for basic medical checkups** : In both Beemandapalli and Thazhaiyuthu clusters, organizing general health camps would allow community members to access regular medical checkups, immunizations, and preventive healthcare

services. These camps would help identify common health issues early, encourage healthier lifestyles, and reduce the burden on local health facilities by providing accessible and free medical services to rural communities.

d. **Reconsidering investment in poultry shed structures**: While poultry farming has great potential for income generation, many beneficiaries have reported underutilization of poultry shed structures. Some have mentioned that they no longer have chicks due to challenges with maintenance, care, and insufficient support. To address these issues, NAF should focus on selecting deserving beneficiaries, providing them with proper training and support in poultry management, and ensuring that the poultry sheds are adequately maintained. This would improve the sustainability and success of backyard poultry farming, allowing it to become a reliable source of income for farmers.

e. **Placing Solar Dryers in accessible locations**: To increase the usage of solar dryers and maximize their benefits, it is essential to place them in easily accessible locations, such as community centers or the NAF office. A central location will encourage more community members to make use of the dryers, particularly for drying agricultural produce, which will reduce post-harvest losses and improve the overall income of the farming community.

f. **Cattle Insurance**: Livestock, particularly cattle, are essential assets for farming communities. Insuring cattle would ensure that farmers are financially protected in the event of illness, injury, or death of their livestock. This support would promote resilience within the community by securing the economic stability of farmers and preventing the loss of critical assets that may otherwise devastate their livelihood.

g. **Implementing cattle tracking system**: NAF should consider implementing a simple, possibly digital, tracking system to monitor cattle it supports. This system would improve program efficiency by enabling easy identification and tracking of cattle during visits. It would also enhance record-keeping, ensuring that livestock management practices are effectively monitored and any interventions or support provided are timely and well-documented.

h. **Seasonal planting of trees**: The selection and distribution of tree saplings should be carefully planned based on seasonal weather forecasts and the water availability of the beneficiaries. By aligning tree planting with optimal environmental conditions, the chances of survival and healthy growth of the trees would increase. This would enhance the success of agroforestry initiatives and contribute to better environmental outcomes, such as soil conservation and increased biodiversity.

i. **Expanding the rotational fund for Enterprise Development**: The rotational fund can be expanded to support not only agricultural ventures but also small businesses like silkworm cultivation. By diversifying the range of enterprises that can benefit from the fund, NAF can foster sustainable economic development, providing long-term financial support for local entrepreneurs. This will help create more stable and diversified sources

of income for the community, boosting local economies and creating opportunities for growth.

j. **Renovating the threshing yard in Attravadi**: The threshing yard in Attravadi, within the Thazhaiyuthu cluster, requires renovation to meet the growing needs of local farmers. Currently, farmers have to travel long distances or use the roadside to dry their crops, which can lead to delays and difficulties in handling produce. Upgrading the threshing yard would provide a centralized location for farmers to process their crops, improve efficiency, and reduce losses. This renovation would greatly support agricultural activities in the area, benefiting the livelihoods of local farmers and enhancing crop handling capabilities.

11. Conclusion

The HEAD project has brought about transformative changes in the Beemandapalli and Thazhaiyuthu communities, significantly improving the lives of residents. By addressing the unique challenges of these villages, the initiatives have not only met immediate needs but also laid the groundwork for long-term sustainability and growth.

With a holistic approach that encompasses water resource management, agricultural improvements, and capacity-building, the projects have strengthened community resilience. Strategic interventions in water conservation, modern farming techniques, skill development, and livelihood support have revitalized local economies, boosted crop productivity, and empowered individuals to achieve greater financial independence.

The high participation in training programs and exposure visits, coupled with active investments in livestock and new enterprises, highlights the success of the projects in building confidence and encouraging proactive community involvement. These accomplishments go beyond short-term improvements to living standards, marking a shift toward sustainable practices that will continue to benefit the community well after the projects conclude.

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. Moreover, these projects showcase the positive outcomes achievable when organizations like TITAN and NAF work together with a shared vision, demonstrating the power of public-private partnerships in creating meaningful, lasting change.

Finally, the NAF team's outstanding rapport with the community and unwavering commitment to their work and their dynamic team has made a significant impact in both clusters, leaving a legacy of community development.

References

1. TWAD report 2023 , Krishnagiri District profile on water level. https://www.twadboard.tn.gov.in/content/krishnagiri
2. TWAD report 2023, Tiruvannamalai District profile on water level. https://www.twadboard.tn.gov.in/content/tiruvannamalai
3. A news article published in New Indian Express dated on 2st March 2023, https://www.newindianexpress.com/states/tamil-nadu/2023/Mar/21/hogenakkal-20-helps-spread-lakhs-of-smiles-in-dharmapuri-krishnagiri-2558065.html
4. Disease report on CD Alert, March 2022 published by National Centre for Disease Control, Directorate General of Health Services, Government of India.https://ncdc.mohfw.gov.in/wp-content/uploads/2024/05/CD-Alert-on-Fluorosis-Final-28-Apr-2022.pdf