TATA

TATA CHEMICALS

IMPACT ASSESSMENT REPORTS

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Impact. Evident.

Tata Chemicals Society for Rural Development (TCSRD), has been tending to the needs of vulnerable rural communities in India since the establishment of TCSRD in the 1980s. TCSRD's multifaceted approach encompasses education, healthcare, skill development, Women Empowerment and sustainable livelihoods, aiming to uplift rural populations nationwide.

EXECUTIVE SUMMARY

Tata Chemicals Limited, through the Tata Chemicals Society for Rural Development (TCSRD), has been tending to the needs of vulnerable rural communities in India since the establishment of TCSRD in the 1980s. TCSRD's multifaceted approach encompasses education, healthcare, skill development, and sustainable livelihoods, aiming to uplift rural populations nationwide. TCSRD built schools, provided digital literacy training, and implemented healthcare initiatives such as mobile clinics and awareness campaigns to improve the well-being of rural residents. Moreover, TCSRD's skill development programs have empowered individuals with the necessary tools to secure employment or start their businesses, contributing to economic growth in rural areas. Through its commitment to sustainability, TCSRD also promotes environmental conservation and community development, ensuring a holistic approach to rural development in India.

To continue the impactful interventions in solving rural issues in the thematic areas of Agriculture, Water storage and conservation, Education, Health, Skill Development, Women Empowerment, and Environmental conservation, the organization has undertaken large-scale projects between the financial years 2020-21 to 2022-23 under the heads of Building Economic Capital, Ensuring Environmental Integrity, Enablers for Social, Economical and Environmental Development, and Building Social Capital, impacting individuals, households and communities across Mithapur region of Gujarat, Cuddalore in Tamilnadu, Mambattu in Andhra Pradesh and Aligarh region of Uttar Pradesh. The Outcomes assessment report assessed the project interventions across the areas to find the insights below.

TCSRD's interventions, focused on building economic capital, aim to improve farm and non-farm livelihoods, enhance skills, and empower rural communities, particularly women. Key initiatives included capacity-building, livestock management, water management, and skill development programs. These efforts significantly increased farmers' income, improved agricultural practices, better livestock management, and diversified crops. Additionally, women benefited from skill-building programs, leading to increased confidence, savings, and additional income through activities like tailoring and handicrafts. Youth were trained in industry-ready skills with a 60-70% placement rate. Recommendations for further impact include strengthening market linkages, enhancing water management, and improving outreach strategies.

Under C-SCAPES, Greening Projects, and Awareness and Training initiatives, TCSRD effectively enhanced marine ecology, restored indigenous flora and fauna, and raised awareness about biodiversity and sustainable practices among rural students and communities. Efforts led to a tenfold increase in fish availability, expansion of coral reef coverage, and discovery of new marine species. Recommendations include engaging young fishermen, gaining policy-level support, and enhancing outreach strategies.

In Health, initiatives like mobile medical vans addressed healthcare gaps, reaching 50,000 people in 22 villages. Continuity and Quality of Education initiatives reached over 71,000 beneficiaries through tailored scholarship projects, learning centers, teacher training, and digital learning programs. Regarding drinking water and sanitation, TCSRD ensured clean drinking water for remote areas, facilitated tap water connections for households, constructed toilets, and provided awareness sessions, significantly improving the quality of life for villagers.

Through SHGs, TCSRD empowered over 3,000 households, fostering economic independence, financial stability, and community bonds among rural women. Recommendations include enhancing economic autonomy, promoting collaboration, providing specialized training, improving digital literacy, and fostering partnerships with financial institutions and organizations for better loan facilities.

Overall, TCSRD's strategic interventions have profoundly impacted thematic areas, improving livelihoods, empowering communities, and fostering sustainable development across the intervening villages.

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Building Economic Capital

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LIST OF ACRONYMS

AI	Artificial Insemination
AIC	Agriculture Information Centres
ATMA	Agricultural Technological Management Agency
C-SAFE	Centre of Excellence for Sustainable Agriculture & Farm Excellence
CSR	Corporate Social Responsibility
EDP	Entrepreneurship Development Programme
FMD	Foot and Mouth Disease
FPC	Farmer Producer Companies
GDP	Gross Domestic Product
GRIMCO	Gujarat Rural Industries Marketing Corporation Ltd.
HDPS	High Density Planting System
ILO	International Labor Organization
IPM	Integrated Pest Management
KVK	Krishi Vigyan Kendra
NREGA	National Rural Employment Guarantee Act
NRLM	National Rural Livelihood Mission
OFPCL	Okhamandal Farmer Producer Company Limited
REDP	Rural Enterprise Development Programme
SHG	Self Help Groups
TCL	Tata Chemicals Limited
TCSRD	Tata Chemicals Society for Rural Development
TCIT	Tata Community Initiatives Trust
VO	Veterinary Officer

INTRODUCTION

India's livelihood landscape is characterized by a diverse mix of farm and non-farm-based livelihoods, with a growing trend towards expanding beyond traditional agriculture to the industrial and services sector; however, agriculture remains a crucial sector, with the nation being a global leader in producing critical commodities like rice, wheat, cotton, sugar, milk, and horticultural products, and employing 60% the labor force and providing livelihoods to over 151 million people, contributing about 18% to the GDP[1].

In recent times, Indian agriculture has encountered escalating difficulties, intensified by frequent extreme weather events attributed to climate change. These challenges exacerbate the persistent problem of food insecurity. Despite significant efforts in food security, India's standing remains low, ranking 107th out of 121 countries in the Global Hunger Index of 2022. Disturbing climate data, like the 36% rainfall deficit recorded in August 2023, underscores the seriousness of the situation. Historical records further highlight the susceptibility of Indian agriculture to climate fluctuations and extreme weather events, severely affecting the livelihoods and well-being of dependent farmers.

Amidst these challenges, the number of income sources within a family emerges as a crucial factor. Despite women constituting 48% of India's population, they contribute only 18% to the GDP[2]. Gender disparities persist, with only 13.9% of women recorded as landholders. Rural women face significant obstacles in accessing skill development opportunities and meaningful employment due to limited education and training facilities, traditional gender roles, and societal expectations. Despite government initiatives like the National Rural Livelihood Mission (NRLM), challenges persist, particularly concerning childcare responsibilities that impede women's economic participation.

Efforts to address these challenges include schemes like the National Rural Employment Guarantee Act (NREGA). Nonetheless, disparities in access to NREGA employment for women persist due to childcare issues. The Ministry of Rural Development's 2020-21 Annual Report highlights a significant increase in women beneficiaries participating in NRLM's skill training programs across various sectors.However, obstacles such as lack of education, skills, credit constraints, and limited access to social capital hinder rural communities' engagement in non-farming occupations.

To tackle these challenges effectively, tailored interventions are needed. These should prioritize enhancing agricultural practices, ensuring water availability, improving soil nutrition, and promoting crop diversification for farmers. Simultaneously, efforts should be made to equip women and SHGs with relevant skills and training.

[1]https://www.statista.com/topics/4868/agricultural-sector-in-india/#editorsPicks)
[2]Gender dimensions of agriculture and rural employment: Differentiated pathways out of poverty - Status, trends and gaps https://www.ifad.org/documents/38714170/40187194/GRE_WEB.pdf/9fb80e6a-0463-4571-b6df-234635454aab

About TCSRD

Tata Chemicals Limited (TCL), a significant entity within the over US$ 128 billion Tata Group, operates globally in Basic Chemistry and Specialty Chemistry Products. Community development is central to TCL's ethos, epitomized by establishing the Tata Chemicals Society for Rural Development (TCSRD) in 1980. This initiative aims to enhance the quality of life in rural areas by fostering self-sufficiency and improving health, education, and infrastructure. TCL's community engagement aligns with the 12 Key Sustainability Development Goals and is guided by eight principles outlined in its community development policy. The company's CSR Program Framework focuses on designing Sustainable, Replicable, and Scalable Development Models to achieve measurable socio-economic and ecological progress, emphasizing active community participation and transparent processes.

TCL's CSR initiatives conform to global frameworks, establishing Centers of Excellence for knowledge dissemination and capacity building. The company actively supports social enterprises and encourages employee volunteering to contribute to national and international welfare. In essence, TCL's dedication to comprehensive sustainability and community development is evident in its multifaceted approach toward achieving measurable socio-economic and ecological advancements.

TCL and partner agencies were pivotal in driving positive socio-economic and ecological outcomes. Majority of the CSR funds were channeled through the Tata Chemicals Society for Rural Development (TCSRD), TCL's primary implementation partner. Additionally, the social enterprise Okhai played a crucial role in empowering women and women artisans, fostering self-reliance within local communities.

Project Introduction

TCSRD is dedicated to fostering livelihood opportunities and improving the standard of living for rural households involved in farm and non-farm activities. In pursuit of this goal, their CSR program implemented various interventions. Recognizing the pivotal role of social and economic development in driving transformative progress, TCSRD emphasized the significance of bolstering economic capital through targeted initiatives addressing critical aspects of both farm and non-farm livelihoods.

Below are the specific interventions under the sub-themes of farm based livelihoods, non-farm based livelihoods, under the theme of building economic capital, which form part of our study.

Themes	Interventions
Farm-Based Livelihood	**Agriculture** ● Capacity building programme to empower communities by equipping them with the knowledge and skills in various areas of agriculture ● Introduction of New Innovative practices to adopt innovative approaches for sustainable agriculture. ● Utilization of Information Technology to improve program reach and effectiveness.

	• Institution Building and Enterprise Development to facilitate the formation of the FPOs to improve market access for agricultural produce and also provide good quality inputs
	Livestock • Breed Improvement for high-yield breeds of Cows and buffaloes to improve milk production • Animal Healthcare & Vaccination to promote better animal health to minimise livestock mortality and improve productivity • Balanced Nutrition to address the importance of proper animal nutrition for optimal growth and production • Enterprise Development to support the farmers for the establishment of FPOs • Livestock Management Training to provide knowledge and skills for effective livestock management
Non-Farm Livelihood	• Okhai Centre for Women Empowerment TCSRD established Okhai to empower rural women and preserve traditional handicrafts. Okhai supports forming self-help groups (SHGs) in villages around Okhamandal, providing training in modern techniques to create handcrafted items celebrating their heritage. • Cluster and Rural Enterprise Development The Cluster & Rural Enterprise Development Programme empowers rural youth, especially women, by equipping them with the skills and fostering an environment for self-employment through cluster development.

METHODOLOGY

Having successfully executed 27 distinct projects across diverse thematic areas, following a community development approach, Tata Chemicals Limited's (TCL) CSR team has positively impacted residents in 40+ villages surrounding the Mithapur Industrial Belt. TCL's CSR team has initiated an outcome assessment study to evaluate the outcomes and measure the achieved impact comprehensively. NuSocia, an Impact advisory firm, has been entrusted with conducting this impact assessment.

The study aims to understand and map the impact of the projects between FY 20-21 and 22-23, which happened majorly across Mithapur in Gujarat, in identifying areas of success and potential areas for improvement. By considering both the efficiency and sustainability angles, TCL seeks to ensure that its CSR initiatives continue to make a meaningful and lasting difference in the lives of the communities it serves.

Objectives

- To assess the societal outcomes of projects and interventions implemented by TCL through TCSRD.
- To analyze the achievements and areas for potential improvements of the programs through our understanding and timely guidance from the TCL team
- To measure the efficiency of the program/intervention delivery, the current impact, and the potential future impact

Research Framework

The impact assessment evaluation will use the REECIS Framework of the OECD DAC (The Organisation for Economic Co-operation and Development's Development Assistance Committee). This framework employs a thorough and inclusive approach to impact assessment consisting of the following components:

1. Relevance: This component assesses the project's necessity within context.
2. Effectiveness: This component scrutinizes the attainment of intervention objectives.
3. Efficiency: This element examines the prudent utilization of cost, time, and resources.
4. Coherence: This ensures that interventions align with and complement similar efforts, fostering consistency.
5. Sustainability: This component primarily evaluates the enduring success of interventions over the long term.

The REECIS Framework provides a comprehensive lens for systematically addressing relevance, effectiveness, efficiency, coherence, and sustainability in the impact assessment process.

Data Collection

The impact assessment study utilized a multi-faceted research approach :

1. Desk Research: Desk research was conducted by analyzing annual project reports, assessment reports, and relevant documents provided by TCSRD and Tata Chemical. Additionally, information available on the Internet was explored to gather comprehensive insights.

2. Key Informant Interviews: In-depth interviews were carried out with key stakeholders, including panchayat members, Government Officials from various departments, Trainers, teachers etc. and the TCSRD team. An interview guide, comprising open-ended questions, was employed to gain a nuanced understanding of the project's effectiveness from diverse perspectives.

3. Focus Group Discussions (FGDs): Beneficiaries were selected through convenience sampling and organized into groups based on thrust areas. Open-ended questions were posed during Focus Group Discussions (FGDs) to elicit insights into the project objectives and their impact on the beneficiaries. This qualitative approach aimed to capture diverse perspectives and experiences within the community.

Sampling

Location	Sub-Theme	Project Name	Methodology	Achieved	
				Key Informant Interviews	Focus Group Discussions
Mithapur - GJ	Farm-based Livelihoods Programmes	Soil and Water Management 1.Capacity Building Programme (10939 - farmers trained) 2. Introducing new and innovative agriculture practices incl. horticulture (18 villages covered) 3. Institution Building & Market Linkages incl. FPO formation, Govt scheme convergence(6197 Farmers)	Qualitative Assessment with on-field visits	Sarpanch: 4 FPO Staff (1) TCSRD team (1) FPO- President and COO (2) KVK (1) Agriculture Officer (1)	Farmers: 5
Mithapur - GJ		Livestock Management 1. Artificial Insemination (2882 cows & buffaloes) 2. Animal healthcare & vaccination (approx. 30,000 animals) 3. Deworming (approx. 50,000 every year) 4. Balanced Nutrition (792 cattle owners) 5. Livelihood Promotion (13 fishing unit set up)	Qualitative Assessment with on-field visits	AI Team (1) Local veterinary (1) Project team (1)	Cattle rearers (3)
Okhamandal - GJ	Non-farm-based Livelihood Programmes	Okhai (Artisans approx 29000)	Qualitative Assessment, Purposive Sampling to cover all arts & agencies with on-field visits	Okhai CEO (1) Sales & Marketing (1) Operation Head (1) Designer (1)	Artisans (2)

Okhamandal - GJ		Cluster development (200 women)	Qualitative Assessment with on-Field Visits	Artisan Outlet (2) SHG President (3) Project team (1)	Cluster (2)
Mithapur - GJ		SAKSHAM Programme (9284 youths trained)	Mixed-Method Approach, On-Field Visits	Trainers (3) Youth KII (15)	Youth FGD (1)

Within the Building Economic Capital theme framework, the study has been segmented into two specific areas: Farm and Non-farm based livelihoods. The research findings have been structured into sections, each sub-theme representing its own section. These sections will explore the project's progress over the years, achievements, findings from primary interactions, a list of successful practices, areas for improvement, and suggestions. The conclusion will consolidate critical insights from each section.

Section 1 : Farm-based Livelihood Programs

1.1. Overview & Impact of Projects

As agriculture continues to be the backbone of India's economy, the importance of interventions to support farm-based livelihoods becomes increasingly evident. With the population steadily rising, there's a growing demand for agricultural products, putting pressure on increasing production. However, this demand coincides with a decrease in available land, mainly due to smaller land holdings among farmers. To meet the needs of a growing population while ensuring sustainable livelihoods for farmers, there's a crucial opportunity to improve land productivity, especially in coastal regions like Gujarat. These areas are characterized by infertile sandy soil, erratic rainfall, and limited water availability.

Initiatives aimed at enhancing farm productivity, promoting agricultural development, and maximizing returns from livestock management are essential to address the above issues, and TCSRD established in 1980, has been dedicatedly working towards improving the agricultural and livestock development in the Mithapur region.

1.1.1. Agriculture Development

The primary objective of the agriculture projects was to foster livelihood opportunities and elevate the quality of life for rural households reliant on agriculture and allied activities while enhancing agricultural production and returns for farmers. This multifaceted approach encompassed several critical interventions aimed at achieving sustainable agricultural development:

Capacity Building Program:

TCSRD initiated capacity-building programs aimed at enhancing farmers' skills and acquainting them with scientific agricultural practices. These programs encompassed on-farm training sessions covering diverse topics such as multi-crop practices, soil health management, water conservation techniques, and integrated pest management.

Commencing with capacity-building training in the year 2017-18, TCSRD effectively organized a total of 112 training sessions between 2020 and 2023. These sessions saw participation from over 1292 individuals hailing from 40 or more villages in the Mithapur region. Despite the challenges posed by the pandemic in 2021, TCSRD, in collaboration with agricultural experts from Krishi Vigyan Kendra (KVK) and Rallis India Ltd., adapted by conducting numerous virtual and on-farm training sessions. This proactive approach ensured the continuation of crucial agricultural education and support during uncertain times, leading to a notable increase in farmers' participation and involvement. More farmers embraced digital services such as online applications and virtual training programs. The improved digital literacy among farmers,

coupled with the utilization of social media platforms, facilitated enhanced knowledge gathering and sharing within the farming community.

Additionally, based on the identified need for exposure to farmers, exposure visits were in Tissue Culture Laboratory at Mundra, KVK, and date palm cultivation farm visits of progressive farmers in the Kutch district were organised for farmers. Farm schools were also arranged from 2019 to 2022 based on farmers' needs in the respective villages only, in the Mithapur region. No exposure and farm visits were conducted in 2023. (Figure 1).

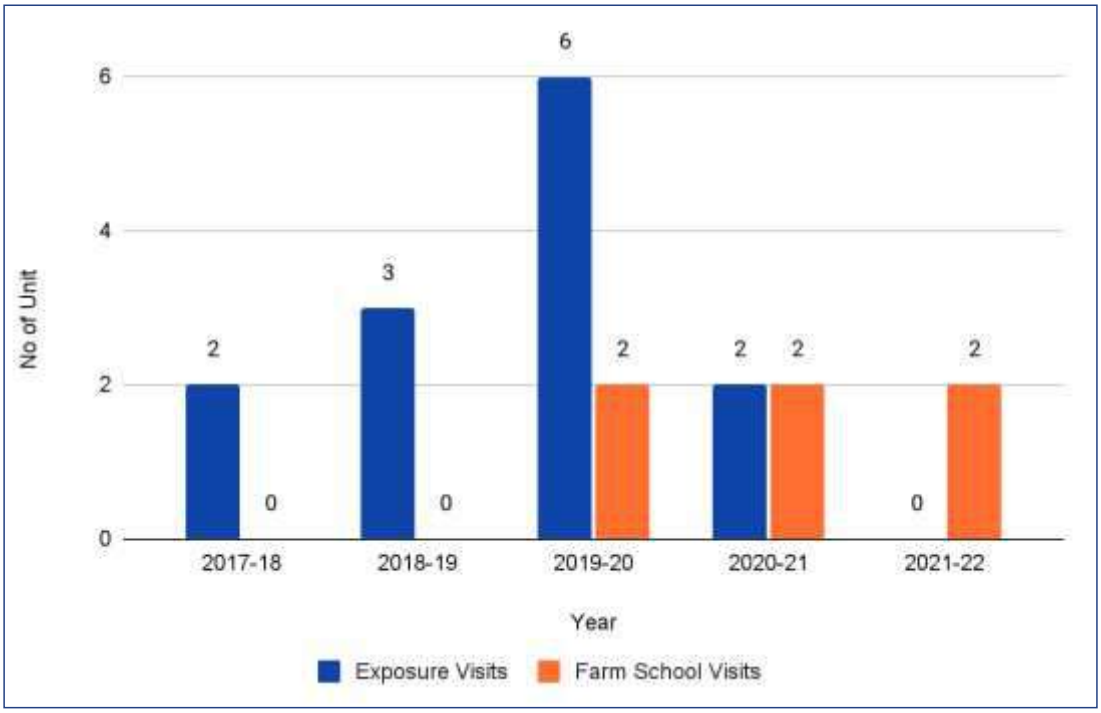


Figure 1: Total number of exposure and farm school visits from FY 2017 to FY 2022

Following this, farmers were supplied with high-quality seeds sourced from the government at subsidized rates, guaranteeing quality and reliability through reputable industries such as Rallis. The distribution of these subsidized seeds aimed to enhance agricultural productivity and encourage the adoption of improved crop varieties, thereby supporting the well-being and prosperity of farming communities.

Additionally, Agriculture Information Centers (AICs) were established to disseminate essential agricultural knowledge, serving as crucial hubs for assisting farmers in accessing government schemes and benefits. The demand for these centers increased over time, with coverage expanding to more than 650 farmers annually in the Mithapur region. (Figure 2).

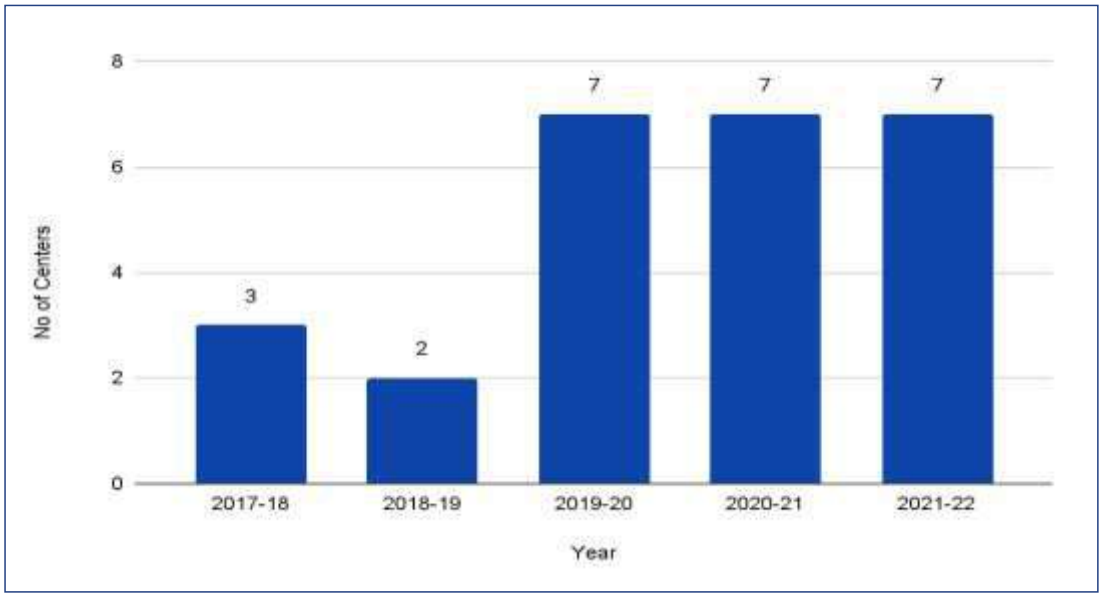


Figure 2: Total number of Agriculture Information Centre established from FY 2017 to FY 2022

These centers facilitated meetings with government departments and the Agricultural Technology Management Agency (ATMA), fostering collaboration and knowledge sharing. Additionally, they conducted demonstrations on the use of bio-pesticides and distributed kits to farmers, promoting eco-friendly pest management practices. Through Information, Education, and Communication (IEC) materials, farmers gained valuable insights and understanding, empowering them to make informed decisions and improve their agricultural practices.

Furthermore, the Agriculture Technology Park (ATP) in Mithapur served as a focal point for technology transfer through live demonstrations on various agricultural techniques, including grow cover, drip irrigation, rain pipe irrigation, and promotion of new crop varieties. This initiative fostered innovation and the adoption of modern farming practices for 239 farmers in 10 different villages. However, the park has been non-operational for the past two years.

Introduction of New and Innovative Agricultural Practices :

TCSRD actively promoted the adoption of new farming technologies and best practices aimed at long-term benefits, such as improved soil fertility and enhanced crop yields. For instance, in Mithapur, High-Density Planting Systems (HDPS) for cotton cultivation were introduced in 2017, leading to sustainable production and cost reduction.

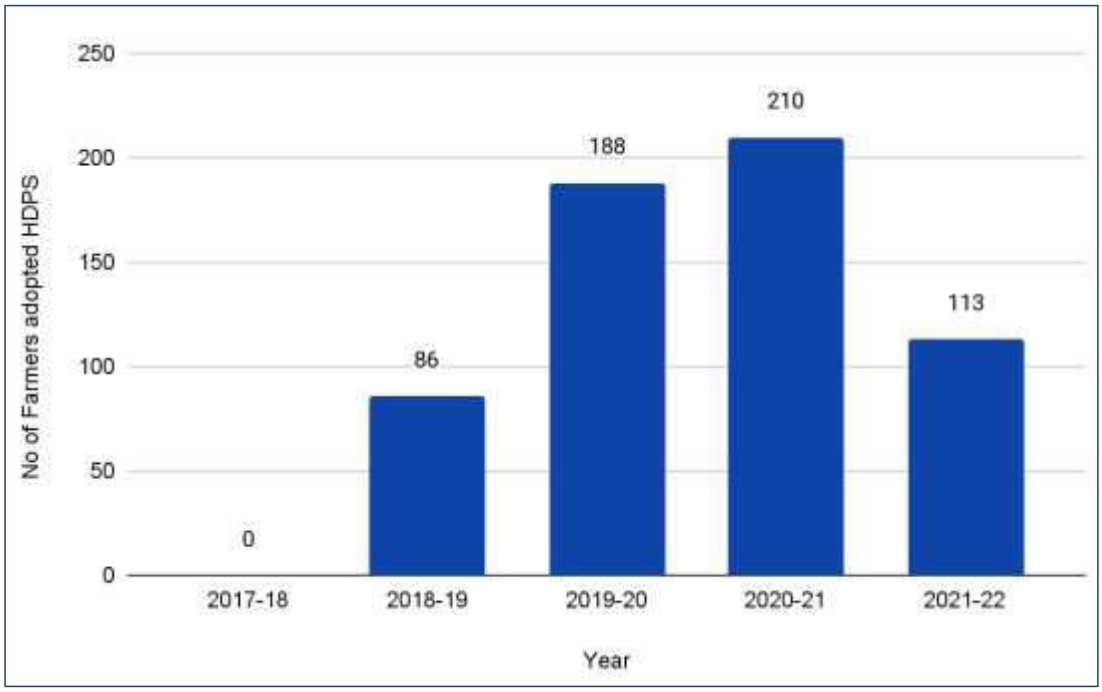


Figure 3: Total number of farmers adopted HDPS from FY 2017 to FY 2022

This initiative was implemented in two villages where cotton crops were cultivated. The strategic placement of these systems helped in weed management and resulted in an increase in crop yield. HDPS also spurred horticulture plantations in Okhamandal that started in 2019-20 with the aim of building another revenue source for farmers. Since this initiative is effective to the farmers, this should be sustained. From 2020 to the year 2023, 579 farmers received a total of 34,000 subsidized plant saplings for various crops such as coconuts, sapota, as well as high-value plants like date farms, mangoes, and dragon fruits.

Moreover, crop rotation or diversification of crops played a crucial role in maximizing the year-round utilization of land, mitigating soil erosion, and enhancing soil fertility by increasing nutrient availability. Additionally, it involved cultivating both cash crops, which were grown for sale in local markets or exports after processing, and subsistence crops, which were primarily for the farmer's own consumption. Cash crops typically offered higher profit margins compared to subsistence crops, making them economically advantageous for farmers. The adoption of these farming practices among farmers was high.

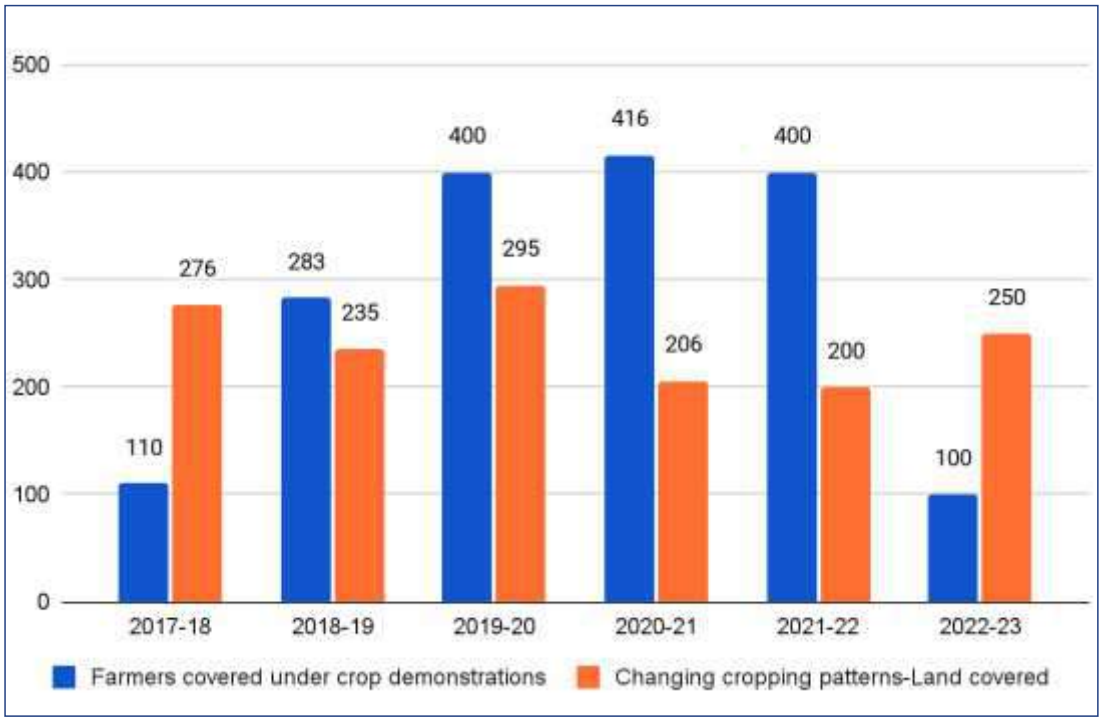


Figure 4: Total number of farmers covered under crop demonstrations and changing cropping patterns from FY 2017 to FY 2023

These demonstrations were initiated in 2017 and covered over 656 acres of land from 2020 to 2023, as detailed in Figure 4, benefiting more than 900 farmers each year. The distribution of IPM Kits resulted in a reduction in pest management costs, with farmers notably improving their pesticide usage efficiency. They transitioned from using over 6-7 ml of pesticides to applying them according to actual requirements, thereby reducing input costs. Moreover, the adoption of bio-fertilizers enabled farmers to enhance soil fertility, further promoting sustainable agricultural practices.

Additionally, TCSRD supported the installation of solar electric fencing systems, protecting a total of 200 acres of land. This ensured crop safety without causing harm to animals or humans, thereby promoting environmentally friendly farming practices. The majority of farmers opted for solar jhatka instead of electric shock. As a result of this intervention, farmers began utilizing land that was previously unused due to animal encroachment, initiating cultivation on this land.

Utilization of Information Technology :

M-Krishi, developed by TCS, is a mobile application designed to deliver real-time agricultural information to farmers in their regional language. The app provided updates on crops, guidance on irrigation, fertilizer application, market prices, and other relevant information, empowering 2200 farmers from the 2020 to 2023 in Okhamandal region with the knowledge needed to make informed decisions. Farmers experienced significant improvements in their livelihoods: their household income increased by an average of 12% annually, driven by a 15% rise in yield and a 15% reduction in input costs.

Institution Building and Market Linkage :

Through its social wing, TCSRD has established the Okhamandal Farmer Producer Company Limited (OFPCL)

to strengthen governance, build member capacity, and establishing robust systems for better market linkage of agricultural products, thus ensuring sustainable growth and prosperity for rural communities.

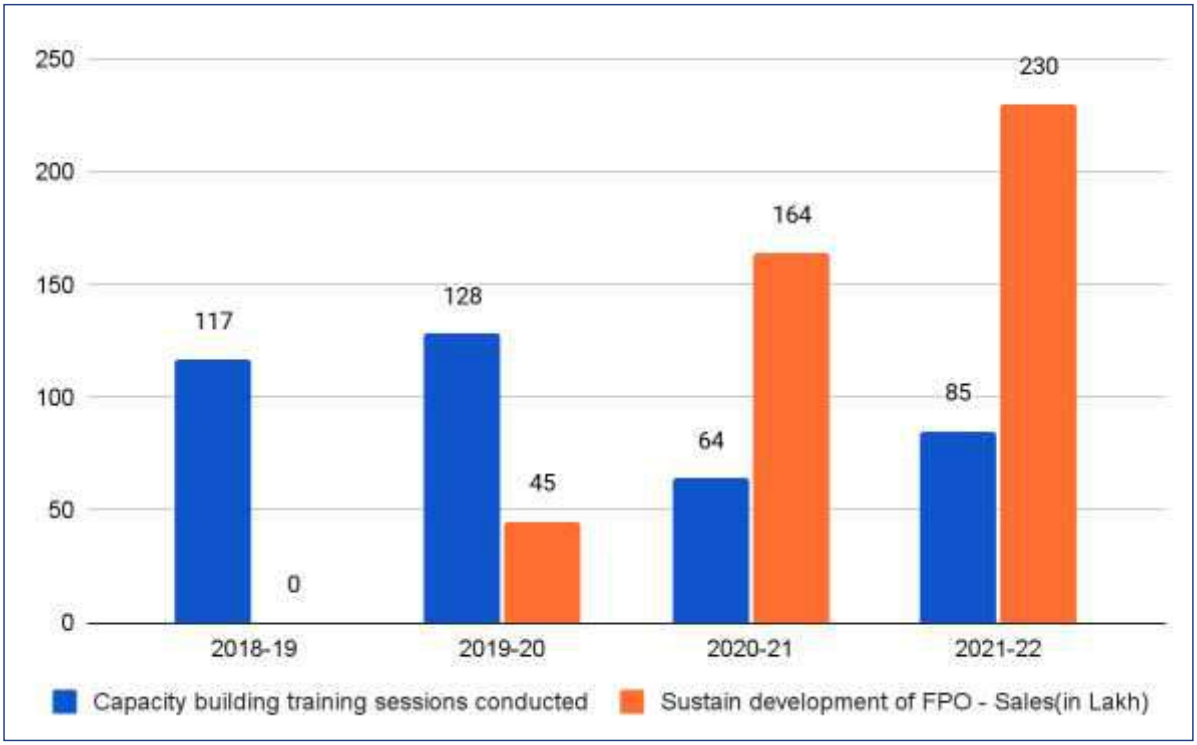


Figure 5: Total number of capacity building training sessions conducted from FY 2018 to FY 2022

A comprehensive capacity-building initiative consisting of 394 sessions, engaging 1818 farmers across 78 distinct villages conducted through the initiative. Figure 5 documented the total number of capacity-building training sessions from 2017 to 2022. Additionally, four new Farmer Producer Organizations (FPOs) were established in 2021-22, and four supportive units were created between 2020-21 and 2021-22, contributing to the expansion of FPO outreach. FPO offers market rate guidance and provides seeds to its members. However, there are no special discounts for member farmers when selling their produce. Through FPO's procurement of crops, farmers benefit from a seamless selling process directly to the FPO, eliminating the need for middlemen and thereby reducing transportation costs.

These efforts collectively yielded sales earnings amounting to 394 lakh rupees and facilitated the integration of 536 farmers into various government schemes in 2022.

During the study period, procurement of groundnuts, cumin, and gram was ongoing but at a low scale, primarily due to the lack of storage facilities, posing a challenge. To address this issue, the FPO acquired land for constructing a storage facility, which would enable them to expand their procurement operations in the future. Additionally, the Agro Centre in Dwarka played a vital role in supporting farmers by providing training, agricultural inputs, and agricultural services. Collaborative efforts with government departments further enhanced the reach and effectiveness of these training programs, ultimately benefiting farmers and promoting agricultural development in the region.

1.1.2. Livestock Management

Livestock is pivotal in supporti0ng households reliant on agriculture, serving as a crucial asset that supplements income and strengthens agricultural pursuits. In Mithapur, TCSRD spearheaded initiatives to bolster livestock productivity, minimize healthcare expenses through preventative measures, and advance fodder development for livestock.

Breed Improvement:

TCSRD implemented Artificial Insemination (AI) programs with the aim of enhancing cattle breeds and milk production. The establishment of cluster-wise AI centers, managed by TCSRD para vets, facilitated door-to-door AI services and organized health camps to improve animal health and breed quality. Over the span of three years, from 2020 to 2023, AI center successfully inseminated a total of 2593 cattle using high-quality semen with a 42% success rate.This intervention significantly contributed to improving the quality of livestock breeds in the next generation. Primary research indicates a noticeable increase in milk production attributed to the enhanced breed quality. Consequently, farmers experienced tangible benefits, with an annual income boost of Rs 25,000.

Animal Healthcare and Vaccination:

Regular vaccination camps were conducted to prevent cattle-related diseases such as Foot and Mouth Disease (FMD), effectively reducing mortality rates and sustaining milk productivity, benefiting a total of 20,311 cattle. Additionally, deworming programs and other health camps were implemented from 2017, benefiting a total of 1,66,348 small and large animals between 2020 to 2023, safeguarding livestock health and mitigating issues like diarrhea caused by worm infestation. As a result of the intervention, three villages were freed from Foot and Mouth Disease (FMD).

The team mobilized communities about health camps through various means such as community meetings or dairies. These health camps provided consultation and treatment for cattle, addressing various health issues. Additionally, for castration and surgery services, the TCSRD team collaborated with the local Veterinary Officer (VO) to deliver these services effectively to the community. This collaborative effort ensured that cattle received necessary medical care and services, contributing to the livestock's overall well-being and the farmers' livelihoods.

Balanced Nutrition:

Green fodder serves as a cost-effective and crucial nutritional feed for cattle. However, due to the region's limited grazing land and recurring fodder shortages, particularly in the summer season, cattle rearers required assistance in providing adequate nutrition to their livestock. To tackle this challenge, the TCSRD

team promoted the cultivation of barseem, oats, and makkhan grass as feeding practices for cattle rearers, aiming to enhance nutrition and increase milk production. In the majority of the Okhamandal area, farmers have adopted perennial lucerne (locally known as "rajka") for green fodder production.Additionally, some farmers are utilizing other perennial grasses such as marvel grass and napier for fodder cultivation.

Over the two-year period from 2020 to 2022, 802 cattle owners from the Mithapur region were enrolled in the distribution of Lucerne and fodder seeds to facilitate fodder cultivation. Additionally, TCSRD introduced chaff cutters to cattle rearers, as these devices help in chopping fodder into small pieces, aiding digestion and ensuring optimal nutrition for the livestock.

Enterprise Development:

To offer alternative livelihood opportunities for landless farmers, fisheries enterprises were established. In the fiscal year 2020-21, a total of 10 lakh fish seedlings, including Indian, sweet water carp, rohu, and catla fish, were distributed. While currently non-functional, there is a potential for development in this area. Moreover, seaweed collected from the Mithapur seashores by the NavJagruti FPO was processed and sold as bio-fertilizer to local vendors in the region. Around 35 fishermen from arambhada and bhimrana are engaged in this work and they earn around Rs 35000-40000 per season.And the season starts from October to March.

Livestock Management Training:

The Livestock Management Training program focused on artificial insemination (AI), cattle health and vaccination, as well as cattle wellness and nutrition. The TCSRD team also assisted cattle rearers in accessing government scheme benefits.

During the COVID-19 pandemic, virtual training programs were organized in collaboration with Krishi Vigyan Kendra (KVK) to equip farmers with essential knowledge and skills in livestock management, ensuring sustainable and efficient management of their livestock assets. Certificates were also provided to participants.
Recommendations for Overall Village Development: Recommendations shared by both groups underscore the need for comprehensive support mechanisms, including crop insurance, borewell subsidies, market facilitation, and agricultural diversification, to ensure the long-term sustainability of village development.

Overall, The agriculture development projects saw an improved understanding of crop management and crop diversity among the farmers as they grew cash crops, pulses, spices, and horticulture, deviating from earlier practices of only growing jowar and bajra and thus increasing farm yields and income. The activities also helped the farmers by providing subsidies for water management equipment such as drip irrigation and sprinklers and distributing saplings for horticulture. With the introduction of new agricultural practices and

technology usage, clubbed with improved knowledge, crop diversification, agri services through FPOs, and efficient water management, the farmers saw 30-40% improved family income and cultivated crops twice a year.

The livestock development activities substantially enhanced breeding quality, animal health, and a 4-5% increase in milk production. This resulted in improved milk quality due to better nutrition facilitated by fodder management. Additionally, concentrated efforts through animal health camps and vaccination drives significantly reduced animal mortality rates across 20 villages.

The Jaldhan activities encompassing the establishment of farm ponds, community water harvesting structures, and micro-irrigation systems empowered farmers to cultivate multiple crops annually, thereby enhancing the dependability of their yields and augmenting income generation through sustainable farming practices. Beyond the economic advantages for farmers, these water management initiatives supported the flourishing of flora and fauna in the area, fostering biodiversity and making significant contributions to local environmental enhancements.

The collaborative efforts between TCSRD and the communities have significantly improved agricultural practices, livelihoods, and overall community development. However, ongoing support and interventions are crucial to address emerging challenges and capitalize on new opportunities for sustained growth and prosperity in rural areas.

1.2. Analysis

Parameters	Description
Relevance	• Agricultural development and livestock activities occurred in the Gujarat coastal region around Mithapur. The area is characterized by sandy soil, with a saline water table within a few meters below the surface. This posed challenges for villagers, of which 95% depended on farm-based livelihoods and animal husbandry. The project aimed to improve the family incomes and reliability of farming and animal husbandry as a livelihood through the relevant interventions across the surrounding villages of Tata Chemical Factory in the Mithapur region.
Effectiveness	• Over the three-year intervention period from 20-21 to 22-23, the project has introduced new farming technologies, helped farmers acquire knowledge, formed farmer collectives for availing various services, provided animal health care services and water management to achieve the overall development of farm-based livelihoods, and in turn, achieved its objectives of bettering family incomes and providing sustainable livelihoods.

Efficiency	• The interventions have greatly enriched farmers within the project period by facilitating extensive knowledge transfer, widespread technology dissemination, crop diversification, and income enhancement. These initiatives maximized available human resources and forged collaborations with diverse organizations to extend reach and scale. Subsidies provided through the project enabled farmers to engage in horticulture, thereby reducing input costs while capacity-building training further streamlined agricultural expenses. As a result, the project efficiently utilized funds to promote economic stability among farmers and their families.
Coherence	• With the changing climatic conditions making agriculture an unviable option for many, the project intelligently collaborated with organizations like C-SAFE, KVK, and other local organizations to disseminate technology and best farm practices and opened FPOs under the relevant laws to bring the collective bargaining power to the farmers, along with providing various farming services. • The project also focused on solving water issues through farm ponds and community harvesting structures, increasing water availability and impacting microclimate. • The sub-theme of Agriculture and Livestock, activities contributed to 8 UN SDGs such as SDG 1, 2, 6, 8, 9, 12, 13 and 15. • The project successfully contributed to the previous efforts by TCSRD and enabled opportunities for collaborations locally and nationwide.
Impact	• The project invested in capacity building of farmers and introduced better agri practices, crop diversity, and water management practices, which resulted in an estimated additional income generation of 30-40%, improved family annual income, and enabled multi-crop cultivation in a year. Also, it successfully managed to change farmers' overreliance on traditional crops to switch to cash crops, pulses, spices, and horticulture. • Additionally, the livestock interventions resulted in improved milk production (4-5%) and quality, with a reduction in cattle mortality and improvement in the breed variety, which will impact further with coming generations of offspring.
Sustainability	• With the improved awareness of crop diversity, crop and water management, introduction of horticulture, and improved animal husbandry with the improved breeds, the project has addressed the pressing and long-term needs of the villages by not just intervening in immediate needs but building capacities of the farmers, and the community to propagate the positive impact. • The project's Long-term sustainability is evident in crop diversification practices, multiple crop cultivation, and improved milk production.

1.3. Practices Worked Well & Can Be Improved

Project	Activity/Practices	Worked well	Can be improved
Agriculture	Capacity building training	Following training sessions, various agricultural practices and techniques, such as High-Density Planting Systems (HDPS), multi-cropping, integrated pest management, and micro-irrigation, have improved farmers' knowledge and significantly lowered input costs.	To enhance the effectiveness of this training program, the TCSRD team can incorporate IEC materials, which will assist farmers in retaining knowledge for extended periods.
	Meeting with the farmers	The regular meetings facilitated need-based capacity-building training for the farmers.	
	Linkages with government departments	Collaboration with KVKs resulted in subsidies for Micro-irrigation and Solar Jhatkas, which benefited farmers with water management and wild animal protection.	
Livestock	Doorstep AI service	Easy Access and timely delivery of AI Service. AI services contributed significantly to improving livestock breeds, thereby enhancing the quality of milk production.	
	Animal Health Care Services	Timely screening and treatment of the cattle helped to reduce animal mortality.	
	Vaccination and Deworming	Easy Access and timely vaccination and deworming of the cattle helped against internal and external parasites, which boosted the immunity of the cattle.	
	Capacity building of Cattle rearers (Balanced Nutrition)	Awareness of livestock management has increased among cattle rearers. Cattle rearers also practiced a balanced nutrition diet for the cattle.	

Table 1: Outcome achievement matrix - Farm-based Livelihood Programs

1.4. Recommendations

Agriculture

1. Inclusion of Technology in agriculture practices:
Inclusion of technology into agricultural practices by utilizing both the mKRISHI and Crop-In apps will be more beneficial for the farmers. mKRISHI provides crucial weather forecasts and pest alerts directly to farmers, empowering them to make informed decisions. Crop-In leverages satellite imagery to monitor crops, identify growth stages, and offer early warnings of disease. This combined approach equips farmers with real-time information and guidance on disease management, pesticide selection, and crop-specific recommendations, ultimately leading to improved yields and farm management.

2. Linkages to Market for FPOs: Primary research indicates that Farmer Producer Organizations (FPOs) have been actively working towards setting up storage facilities to enable larger-scale procurement of agricultural products from farmers. Furthermore, there is a potential for FPOs to enhance their outreach and establish connections with broader markets.

3. Convergence of Government Schemes: The TCSRD team is assisting a limited number of farmers in accessing benefits from state and central government schemes. However, it's crucial to broaden this support to reach a larger number of farmers and enable them to capitalize on government schemes.

Livestock Management

1. Pashu Sakhi Model (Village-based Volunteer): In Okhamandal taluka, most households own livestock. However, transporting cattle to veterinary clinics poses a significant challenge. The area lacks adequate transport facilities for animals, making it challenging for farmers to access veterinary services.

Veterinary Officer (VO) rarely conducts field visits due to office and other commitments, leading to limited on-ground support for farmers. About 80% of animal treatment cases are handled by local private paraveterinary workers. These workers often charge high fees and provide treatments based on their convenience rather than the animals' needs.To tackle this issue effectively, implementing the Pashu Sakhi model in the area could provide a solution, enabling broader coverage of households and addressing transportation challenges for veterinary care.[3]

2. Tele-Medicine[4] offers remote consultation services for emergency livestock health issues, providing cattle rearers in remote areas with access to timely treatment and assistance. This service helps overcome the challenge of limited accessibility to livestock health services in remote locations.

3. Formation of a Milk producer company (replica of Shwetdhara Milk producer company by Tata Trust)[5] :
Cattle rearers were enthusiastic about establishing a company to sell their milk and dairy products. This will not only improve their earnings but also enhance the value of their produce.

4. Awareness of Fodder Management: Introducing green nutritional grass such as Dashrath, Napier, Makkhan, and Sorgam Grass to cattle rearers is essential. This initiative aims to enhance the quality of cattle

[3]https://www.worldbank.org/en/news/feature/2022/12/13/jharkhand-s-pashu-sakhis-the-community-animal-healthcare-workers
[4]https://www.niti.gov.in/sites/default/files/2023-07/Telemedicine-for-Livestock-Health_Inside%20Report_18072023.pdf
[5]https://www.shwetdharamilk.com/about-us/

milk production and overall nutrition. Moreover, these grass varieties are available to cattle rearers at a low cost, ensuring accessibility and affordability.

5. Team expansion: The extensive reach of the agriculture and livestock management program presents a tremendous opportunity for impact. To fully capitalize on this potential, we recommend expanding the program team. A larger team would allow for a more focused approach. They would have the bandwidth to dedicate more time and attention to each program aspect, ensuring quality service delivery and participant support.

6. Promotion of National Livestock Mission (NLM): Cattle rearers should be encouraged to establish connections with the National Livestock Mission. This initiative by the central government facilitates cattle rearers in procuring livestock through accessible loans.

Section 2 :
Non-farm Based Livelihood Programs

2.1. Overview & Impact of Projects

Non-farm-based livelihood activities are essential for diversifying rural economies and reducing dependency on agriculture in India, especially in regions facing agricultural challenges. Recognizing this, TCSRD empowers rural communities through skill development initiatives tailored to non-farm sectors like handicrafts, handloom weaving, dairy farming, and entrepreneurship. By providing training, market linkages, and access to finance, TCSRD enables individuals to pursue alternative sources of income, contributing to economic resilience, job creation, and sustainable development in rural areas.

2.1.1. Okhai Centre for Empowerment:

The Okhai Centre for Empowerment, a collaboration between TCSRD and Tata Chemicals, originated from a successful handicrafts development program that supported rural artisans in the Okhamandal region in 2002. These artisans, belonging to communities such as Rabaris, Vaghers, and Ahirs, lacked stable income opportunities and struggled financially. Okhai aimed to provide rural women a pathway to economic and social independence by enabling them to earn independently. Through training programs, women from self-help groups (SHGs) learned modern handicraft production techniques and skill development, design, costing, and visual merchandising.

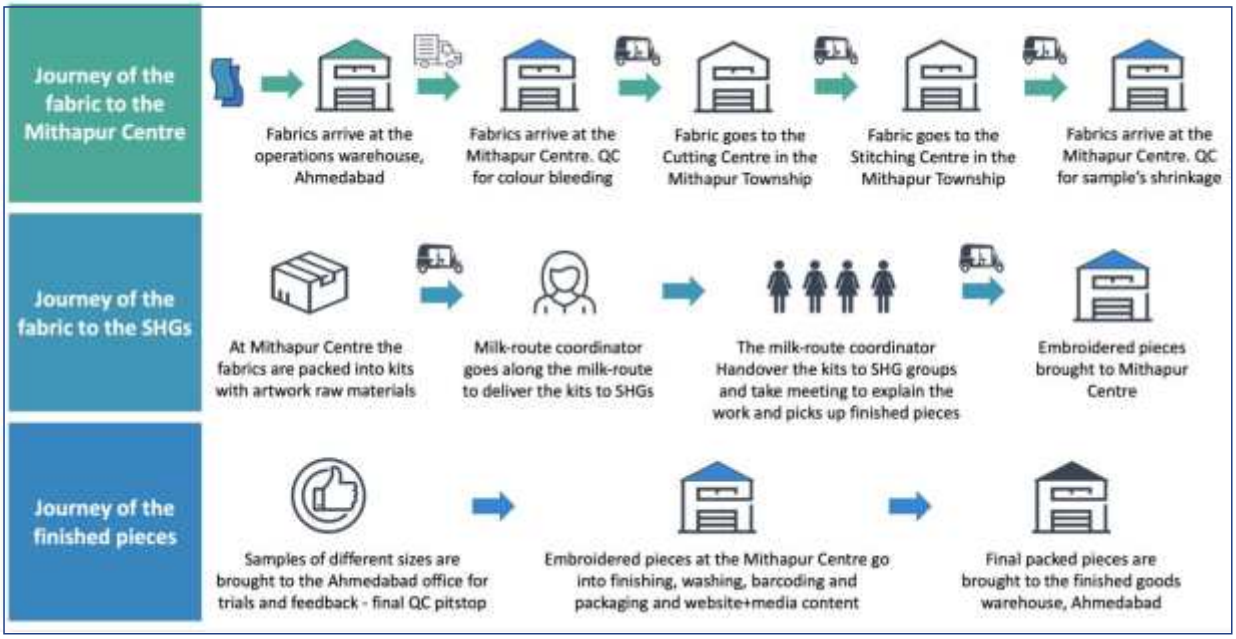
Initially launched in Mithapur (Gujarat), the Okhai program expanded to other states like Uttar Pradesh, Rajasthan, West Bengal, Maharashtra, and the Northeast. Okhai, which became registered as a charitable trust in 2008, acts as a liaison between artisans and customers, enhancing sales of their handicrafts by understanding customer preferences, collaborating with artisans in product manufacturing, and facilitating sales through various channels, including its website and outlets.

Okhai's supply chain begins with the arrival of fabric in Ahmedabad. In Ahmedabad, Okhaii has two warehouses, one is the operations warehouse and other is the finished goods warehouse.

The sourced fabrics first arrive at the operations warehouse, where it undergoes quality checking before being sent to the Mithapur centre. At Mithapur, the fabric gets quality checked for colour bleeding and then, with the help of the local auto services it is transported to the cutting and stitching unit in Mithapur. Once the pieces are stitched, they arrive back at the Mithapur centre and the pieces go through a quality check to see if there is any shrinkage.

Then, the stitched pieces and the raw materials needed for the artwork are packed as a kit and sent along the milk route to the SHGs with the help of the local auto services. A milk route coordinator travels along to distribute these kits, explains the work to the SHG heads and also collects the completed pieces. The SHG heads then distribute the bundles to women in specific SHGs, who complete the embroidery within a specified timeline. The embroidery process is standardised across all SHGs, with designs and materials provided on a sheet.

The embroidered pieces are brought back to the Mithapur centre and then samples of different sized garments are sent to the Ahmedabad office for trials and to see the fit and comfort of the garments on customers. Interestingly, the female staff members of the Ahmedabad office are actively involved in this process and real feedback is collected from them after trials of the garments. This marks the final quality check pitstop for the garments. Post this, the garments go into finishing at the Mithapur centre. Once the finishing is done, the final production steps such as washing, barcoding and packaging and content for media/website pages are carried out. The final, ready-for-sale pieces are then brought to the finished goods warehouse in Ahmedabad.



Okhai's supply chain

Through targeted initiatives like training programs and market outreach, Okhai facilitated skill development and product promotion, significantly increasing sales and online engagement. Notably, in the fiscal year 2020-2021, Okhai recorded a remarkable 68% increase in sales, with artisans earning monthly incomes ranging from Rs. 5,000 to Rs. 15,000. Recognized as a sustainable online fashion brand, Okhai expanded its

[6]TCSRD Annual report 2020-21

reach beyond Gujarat and reached states like Uttar Pradesh, Rajasthan, and Maharashtra. In 2015, the Okhai website was launched, followed by the opening of Okhai's Flagship store in Kala Ghoda, Mumbai, in 2020.[6]

In 2020, when the pandemic struck, Okhai shifted to a marketplace model to assist numerous tribal and rural artisans across India in becoming independent and self-reliant. This led to a significant increase in the number of artisans associated with Okhai (see Figure 6). During this transition, Okhai utilized technology such as Intertakt software, providing a competitive advantage over its market competitors.

In the fiscal year 2021-2022, Okhai achieved notable success by being recognized as a Sustainable Online Fashion Brand. It has garnered over 376,000 followers on Instagram, 129,000 followers on Facebook, and even 5000 followers on LinkedIn, and it has served 109,479 online customers. Additionally, Okhai successfully engaged with customers and artisans in face-to-face interactions through participation in exhibitions.

By expanding into the online marketplace and bringing other artisan brands on board, Okhai has significantly increased its reach. The number of women artisans benefiting from the platform has skyrocketed from 2,364 in 2019-20 to 24,367 in 2020-21, marking a tenfold growth(due to online platform). These numbers continue to rise steadily, with Okhai now benefiting nearly 30,000 women artisans across various states in India.

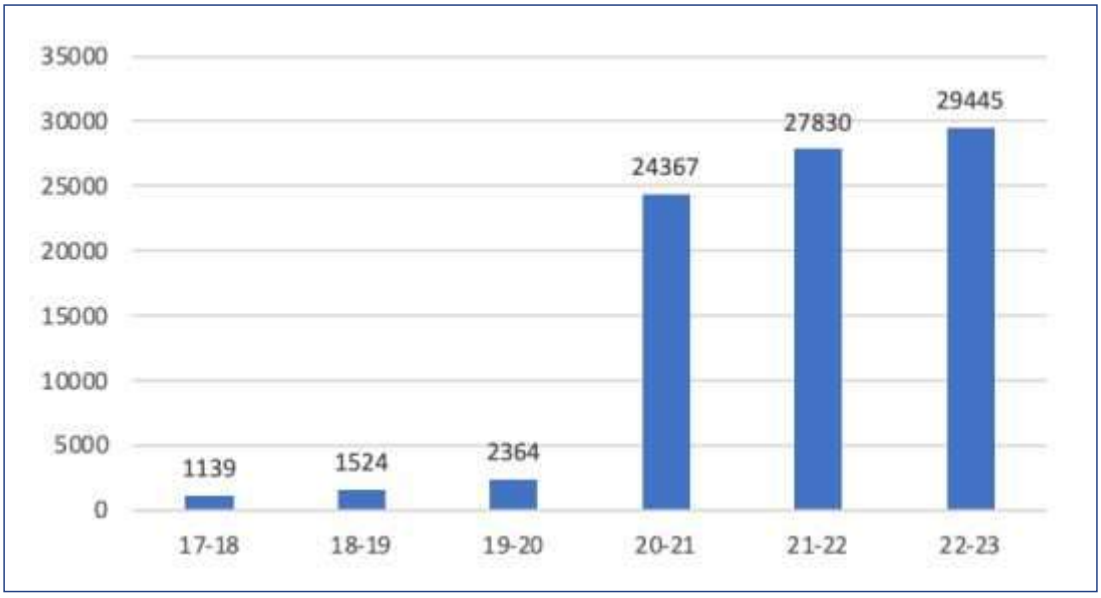


Figure 6: Artisans impacted under Okhai from FY2018 to FY2023

With the improved reach, the Okhai brand's annual sales have increased significantly from 651 lakh rupees in 2019-20 to over 1267 lakh rupees in 2022-23, doubling the sales within three years, and the year 22-23 had seen a dip in the overall sales as the organization underwent major operational streamlining internally which affected the sales. (Figure 7)

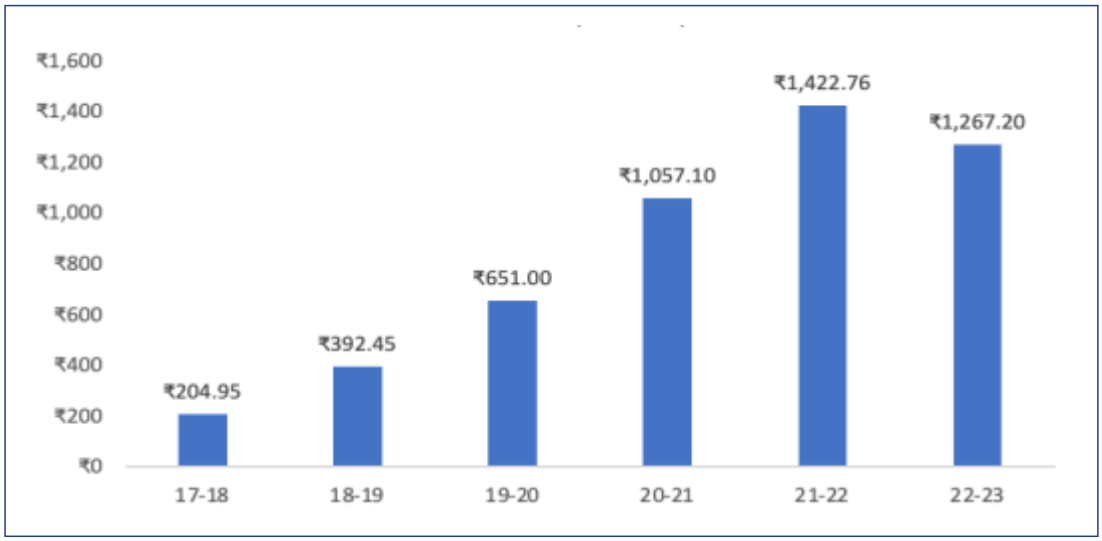


Figure 7: Okhai's annual sales in lakhs from FY2018 to F20Y23

In addition, through conversations with the artisans, trainers, designers, and production managers of the Okhai, the study found that, Initially, the program focused on training women in modern handicraft production techniques, design, costing, and visual merchandising. As a result, **women gained practical skills and knowledge, enabling them to engage in income-generating activities such as embroidery, sewing, and animal husbandry.** One of the participants noted, *"Earlier, we did not go out of the house; now, we go out alone and do many things like stitching and embroidery."*

Through participation in self-help groups (SHGs) and clusters, women experienced social and economic empowerment. **They learned financial management, gained confidence, and became financially independent.** Another artisan highlighted, *"Earlier, the sisters of our society were afraid to speak to anyone, but now the sisters of TCSRD have taught us a lot about how to speak to anyone. How to save money."*

Furthermore, the center provided capacity-building training sessions, including skills development, entrepreneurship, and new design training. These training sessions were instrumental in enhancing both individual and group capabilities; in one of the artisan's words, *"TCSRD trained sisters in Ahmedabad, then they went to Tejashwi training, 15 days training was given in embroidery class, sewing cutting, etc. training was given to the sisters."*

Okhai facilitated collaboration among different clusters, providing learning and knowledge-sharing opportunities. Regular meetings allowed participants to **exchange ideas and experiences, fostering a supportive community.** *"Sometimes meetings are held with all the clusters when all meet and learn new things from each other."* Expressed an artisan.

Moreover, the center changed societal perceptions toward women's participation in livelihood activities. Initially criticized, women artisans are now **respected for their contributions to family income.** One participant mentioned, *"Earlier, the people of the society used to criticize the women, but now, since the women join the cluster and help the family financially, the views of the people of the society have changed, and the women are allowed to do their work."*

Looking ahead, participants envision expanding their business ventures and enhancing their skills. They aspire to learn driving, computer skills, and English to explore online marketing opportunities. Another

participant emphasized, *"Sisters need to learn computer, drive and learn English to enable them to do online marketing in future."*

Overall, the Okhai Center for Empowerment has empowered women artisans socially and economically. The program has enabled **women to lead more independent and fulfilling lives** by providing training, fostering collaboration, and changing societal attitudes.

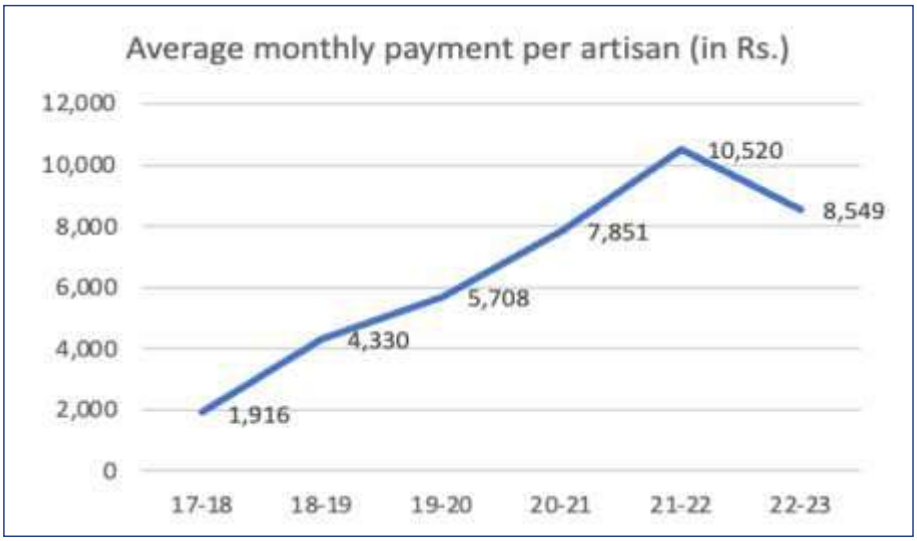


Figure 8 : Artisan's monthly payment from FY 2017 to FY 2023

A conversation with the Okhai team revealed the incredible impact their work has on artisans' lives. Over the past six years, they have witnessed a dramatic shift in confidence. Artisans who were once hesitant about new designs now embrace them with a "you can take any design you want, we'll do it!" attitude. This transformation is a direct result of Okhai's commitment to continuous training, capacity building, and open communication.

The positive impact goes beyond professional skills. One artisan, who also serves as a milk route coordinator, used her Okhai earnings to purchase a second-hand scooter. In her mid-50s, she learned to use a smartphone and WhatsApp with the support of her manager. This newfound skill was such a significant achievement that she insisted it be noted on her appraisal form. Stories like hers highlight the profound emotional impact of Okhai's work.

The team also takes pride in empowering single mothers within their Self-Help Groups (SHGs). Okhai earnings allow these women to send their children to school, manage household expenses, and build a brighter future. Hearing these stories firsthand is a deeply moving experience for the Okhai team, solidifying their commitment to empowering artisans and transforming their lives.

2.1.2 Cluster & Rural Enterprise Development

The Cluster & Rural Enterprise Development Programme, initiated by TCSRD in 2003-04, aims to empower rural youth, particularly women, by equipping them with the skills needed for self-employment. This initiative is especially crucial in areas like Mithapur, where challenges such as low rainfall and limited groundwater for agriculture pose significant obstacles to livelihoods. To address these issues, the program strongly emphasizes poverty alleviation through entrepreneurship.

TCSRD works in collaboration with partners like the Gujarat Rural Industries Marketing Corporation Ltd. (GRIMCO) and government initiatives to bolster Self-Help Group (SHG) clusters that work with various raw

materials, including leather, rexine, bandhani, block print, bead, jute, clay, coconut fibre, and paper. In Okhamandal, renowned for its skilled artisans, TCSRD is deeply involved with women artisans, providing them with training and empowerment opportunities to help them access broader markets for the products they make from these raw materials.

Through the Rural Entrepreneurship Development Programme (REDP), TCSRD facilitates capacity building and technical training, paving the way for establishing small enterprises and promoting sales. This approach has yielded tangible outcomes, with the emergence of seven clusters in Mithapur specializing in Bandhani, Rexene, Beadwork, Jute, Coconut Fiber, Dungaree, and Patchworks. These results underscore the program's effectiveness in creating sustainable economic opportunities in rural areas.

STEP 1
Creating a each cluster by spreading awareness and capacity building.

STEP 2
Providing REDP and technical training

STEP 3
Creating cluster production plan which includes purchase of raw materials, creating products etc.

STEP 4
Proving market linkages and promoting sales through shops, local market, exhibitions, bulk order, government andnew market linkages.

In FY20, the 'The Artisans' Mall,' a new cluster shop, was started in Mithapur to increase the sales of products from the above clusters, and these clusters also leverage Okhai to reach a wider audience.[7] Over 225 artisans were registered with the seven clusters and made and sold products based on raw materials at the end of 2023.

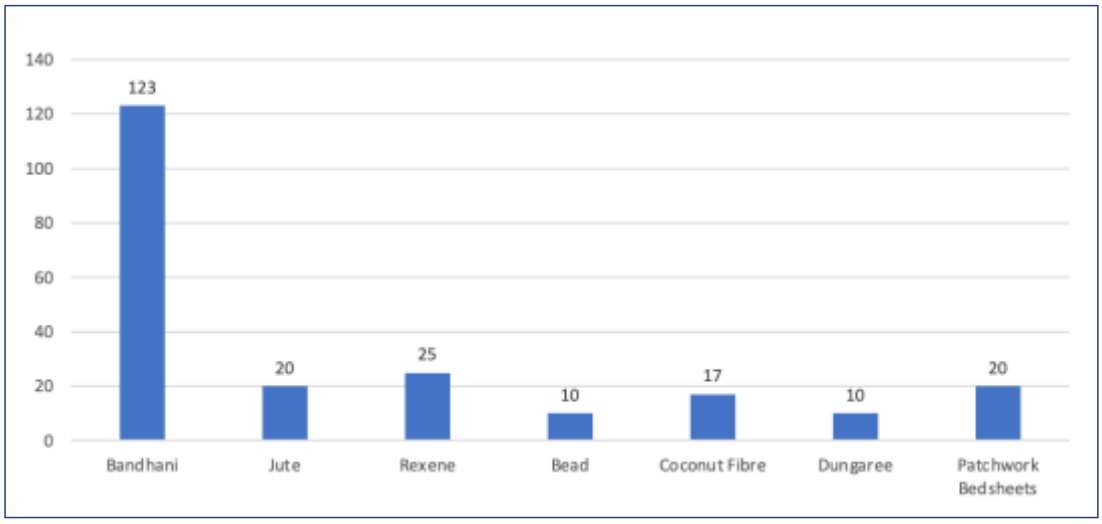


Figure 9 : No. of artisans in all seven Clusters

[7]TCSRD Annual Report 2019-20

In the seven clusters, annual sales varied from 16.14 lakhs in 2020-2021 to 26 lakhs before the onset of Covid-19 in 2019-2020, averaging 21.7 lakhs per year. The most recent sales figures for the fiscal year 2022-2023 stood at 25.12 lakhs. The decline observed in 2020-2021 was attributed to a decrease in the number of exhibitions and melas that the clusters could organize, which are their primary sales channels, and the sales reached to their normal size in the subsequent years.

Figure 10 : Clusters' annual sales in lakhs from FY2017 to FY2023

The SHG cluster development initiative has profoundly impacted rural women artisans, significantly improving economic independence, social empowerment, and overall community development. By establishing SHG Federations in villages like Bhimrana, Makanpur, and Lalsingpura, where the study has interacted with beneficiaries, the women have found a platform to collaborate and work towards common goals. Across the three villages interviewed, these federations comprised 49 SHGs and have played a crucial role in providing support, organizing training programs, and conducting capacity-building sessions.

One of the key achievements of the initiative has been the positive response from family members, who actively support women's involvement in livelihood activities. This support has increased women's autonomy in decision-making within their households. Despite initial challenges in depositing savings and overcoming apprehensions about the reliability of the SHG system, the federations have persevered and made significant strides in enhancing income generation activities and expanding savings initiatives.

Similarly, the cluster development activities in Makanpur, led by determined individuals, have transformed the lives of fellow women artisans since its inception in 2013. Through collective effort and training provided by TCSRD, women have gained essential skills in savings management, accounting, and various income-generating activities. This has not only increased family income but has also garnered respect and recognition within society.

"Since joining the cluster, we've witnessed significant transformations, both socially and economically, as well as on a personal level. Previously, women in our community were confined to their homes, but now they have gained independence and can engage in various activities outside. This newfound self-reliance has empowered them to undertake tasks independently and contribute effectively to different endeavors. Moreover, the perception of women within the community has evolved positively, resulting in increased respect and recognition for their contributions. Women's participation in economic activities has also grown, leading to higher household incomes. Additionally, there has been a notable rise in educational attainment among women." - FGD with Women from SHGs, Makanpur.

However, challenges such as the need for more support for selling manufactured goods persist, indicating the need for further assistance in marketing and sales. Despite these challenges, the community's response to women's participation in these groups and activities has been overwhelmingly positive, with society providing the necessary help and support.

The cluster development activities overseen by the cluster coordinator have further amplified the initiative's impact. With a focus on addressing the community's specific needs, mobilization efforts target women aged 18 to 35-40 with at least a 3rd/4th standard level of education. Continuous improvement in training quality and stakeholder engagement, including collaborations with organizations like Okhai and Rexin Cluster, has been critical to the program's success.

Looking ahead, there is a unanimous consensus on the program's effectiveness, with suggestions for further enhancement focusing on areas like expanding income-generating activities and addressing the specific needs of the artisans, such as introducing embroidery work in sarees. Despite its successes, areas for improvement include enhancing digital presence and further streamlining project implementation processes to ensure sustainability and scalability beyond the initial project period.

2.2. Analysis

Parameters	Description
Relevance	• Given that the local population in the Okhamandal region primarily consists of SC and OBC communities with a significant cultural and traditional heritage, it was essential to leverage their existing knowledge and skills to establish alternative non-farm livelihoods, particularly in an area heavily reliant on agriculture. Therefore, the project has prioritized enhancing the capacities of women throughout the Okhamandal block, capitalizing on their proficiency in stitching and sewing. • The project is relevant in improving women's and their families' economic and social capital through capacity building and income generation.
Effectiveness	• The project successfully achieved its objectives of enhancing livelihood opportunities for women through Okhai and Cluster development initiatives. Both activities bolstered women's capabilities and enhanced their understanding of financial management and savings. Moreover, the projects fostered confidence among the women, empowered them to voice their

	opinions, and facilitated their involvement in decision-making within their families. Overall, these activities effectively addressed their intended objectives and brought about positive changes in the lives of the women involved.
Efficiency	• The introduction of Clusters and the Okhai brand has effectively leveraged local resources, including human capabilities and raw materials, to create economic value while enhancing the socio-economic status of women over time. A significant portion of project funding was allocated to compensate women artisans based on their production. Meanwhile, the revenues from Okhai brand sales needed to be increased to sustain overall operations independently. This highlights the need to improve sales and profitability to ensure Okhai becomes an autonomous brand.
Coherence	• The project benefitted from collaboration with GRIMCO for marketing and promotions and formed SHGs and Clusters to create a community for women to learn and grow. It beautifully integrated its supply chains with the local milk routes and took local auto rickshaws' help to deliver the women's production materials. • However, it was observed that there were no financial/microfinance collaborations for the funding requirements of the women, and the SHGs were not registered with the NABARD and SRLM/NRLM, which will create more sustainable access for funding and work among the SHGs. • The non-farm activities contribute to the national and international SDGs of SDG 1, 5, 8, 10, 12, and 17, focusing on women's development and reducing gender inequalities.
Impact	• The Okhai initiative and Cluster development have had a transformative impact on women artisans in Gujarat, empowering them socially and economically. Initially, the program focused on equipping women with modern handicraft production techniques, leading to increased practical skills and knowledge in activities like embroidery and sewing. Participation in self-help groups and clusters facilitated social and economic empowerment, enhancing financial management skills and boosting confidence. Moreover, capacity-building training sessions and collaboration among clusters provided valuable learning opportunities and fostered a supportive community. The initiative also successfully changed societal perceptions towards women's participation in livelihood activities, garnering respect for their contributions to family income.
Sustainability	• Regarding skill development and social impact among the women artisans, notable positive changes have occurred within their families and communities. Women have become active contributors financially and in decision-making processes. However, Okhai's sustainability as a business remains reliant on CSR funds. Okhai must attain an annual sales turnover of 25 crore rupees or more to achieve self-sufficiency.

2.3. Practices Worked Well & Not Worked Well

Project	Activity/Practice	Worked Well	Can Be Improved
Okhai	Selection of the women from villages for embroidery work	Women from villages are chosen based on their embroidery skills, regardless of their level, and are given the chance to showcase their abilities.	
	Training program for artisan women	Selected women undergo training to enhance their skills and craftsmanship quality. In the program, they rotate through embroidery, sample making, cutting, stitching, cleaning, packing, and dispatch units, facilitating learning across various tasks and processes.	
	Participation of artisans in design making and deciding wages	Women artisans actively contributed by suggesting patterns, stitch designs, and colors for product designs and also participated in finalizing wages per piece.	
	Weekly team meeting	Weekly team meetings ensured everyone is updated about the work progress and aligned on the same page regarding products and center activities.	
	Participation of women in Exhibitions	Participating in these activities exposed women to places and individuals from their trade, thereby boosting their confidence and providing valuable networking opportunities.	
	Succession plan	The succession plan spanned around 7-8 months, facilitating a smooth transition for recruits to understand and assume their positions effectively.	
	Inventory recording system		Digitizing inventory recording by introducing MIS systems will alleviate staff workload.

Cluster Development	Training programs for the women	Training provided under the REDP effectively fostered collective work among women, resulting in successful cluster formation and operation.	Women should receive education on financial inclusion to enable them to access financial services and fulfill the requirements of their enterprises.
	Linkage to Vendors/Market		Clusters such as Bandhani and Jute should receive support to facilitate connections with vendors and markets in other cities such as Ahmedabad and Vadodara.

Table 2: Outcome achievement matrix - Non-farm Based Livelihood Programs

2.4. Recommendations

1. Digital Literacy Enhancement: Women artisans in Okhai and Cluster development maintain their records manually, indicating a need for digital literacy training. Introducing digital skills will streamline their work processes and reduce the burden associated with manual record-keeping.

2. Regular Health Camps: Prolonged hours of sitting and working lead to health issues like poor eyesight, backache, and knee pain among women artisans. Conducting regular health camps will address these concerns and ensure the well-being of the artisans. Additionally, providing supportive chair facilities can alleviate backache caused by extended periods of sitting on the floor.

3. Establishment of a Design Library: The Okhai Center would benefit from establishing a design library containing all their creations. This resource would assist the leadership team and artisans in accessing and utilizing past designs effectively, facilitating future design processes and innovation.

4. Spoken English Training: Participation in exhibitions requires effective communication with customers and visitors. To enhance communication skills, women from Okhai and the Clusters expressed a need for basic English training to enable them to interact confidently with a diverse audience.

5. Capacity Building for Clusters: Capacity building training is essential for clusters to improve financial record-keeping and inventory management. Providing this training will empower women with the necessary skills to manage their enterprises effectively. Additionally, ongoing handholding support is crucial to ensure sustained growth and success.

6. Transportation Facility for Okhai Centre in Mithapur: A significant amount of transportation is required between the Mithapur center, its units, and the villages where artisans are engaged in their work. Currently, reliance is placed on local transportation, such as rickshaws, for this purpose. Therefore, transportation facilities are requested to be provided to the Okhai center, which would facilitate these movements.

7. Integration with Government Schemes: Women SHGs associated with Okhai and Cluster Development should be registered with state government departments like SRLM to access benefits such as lower loan interest rates. This linkage will enhance financial sustainability and enable SHGs to leverage government support effectively.

8. Expansion of Cluster Products to Larger Markets and E-commerce Platforms: To broaden the market reach of cluster products, it's imperative to connect with markets beyond Dwarka and Jamnagar, extending to cities like Ahmedabad and Vadodara. Utilizing the Okhai warehouse in Ahmedabad as a distribution center can facilitate offline and online sales, significantly expanding the customer base and market presence.

Section 3 : Conclusion

Tata Chemicals Limited's CSR, with the help of TCSRD, has made a significant positive impact on residents of various villages surrounding the Mithapur Industrial Belt. The outcomes assessment study, covering projects between fiscal years 2020-21 and 2022-23, thoroughly evaluated outcomes and impacts, focusing primarily on the location of Mithapur (Gujarat).

The interventions, centered on the theme of Building Economic Capital, were structured around improving both farm and non-farm livelihoods. These initiatives aimed to boost farm-based incomes, increase agricultural productivity, and empower women and rural communities through skill development programs. Key interventions included capacity-building, livestock management training and formation of SHGs and clusters and skill training for women. These efforts addressed critical challenges faced by rural communities, including water scarcity, limited agricultural knowledge, the need for sustainable practices, and economic value creation.

The impact of these interventions was significant, resulting in an estimated additional income generation of 30-40% for farmers, improved agricultural practices, and better livestock management. The initiatives successfully diversified farmers' crops, enhanced water management through innovative techniques like drip irrigation and farm ponds, and increased livestock productivity and quality. Community engagement and active participation were vital factors in the success of these programs, fostering trust and commitment toward development initiatives. The projects also focused on empowering women through skill-building and financial literacy, leading to increased confidence, savings, social standing within the family and community, and additional income generation through activities like tailoring, embroidery, and handicrafts.

To further enhance the impact of these interventions, several recommendations were proposed by the stakeholders. These included strengthening market linkages for farmer-producer organizations (FPOs), and fostering collaborations with government schemes. Additionally, suggestions were made to improve water management by implementing safety walls around farm ponds, promoting solar-based lift irrigation, and implementing digital record-keeping for the clusters. These improvements aim to ensure the sustainability and effectiveness of the interventions, leading to long-term benefits for rural communities.

In conclusion, the thematic interventions undertaken by TCSRD in partnership with Tata Chemicals Limited have been pivotal in transforming the lives of rural communities by equipping them with skills, knowledge, and resources for sustainable livelihoods. The impact assessment study underscores the success of these initiatives and offers valuable insights for future enhancements, ensuring that CSR initiatives continue to have a meaningful and lasting impact on the communities they serve.

Ensuring Environment Integrity

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BVIEER	Bharati Vidyapeeth Institute of Environment Education and Research
CSR	Corporate Social Responsibility
C-SCAPES	Centre for Sustainable Conservation Action for the Protection of the Ecosystems of the Seas
FGD	Focus Group Discussion
GDP	Gross Domestic Product
KII	Key Informant Interview
MIS	Micro Irrigation Systems
TCL	Tata Chemicals Limited
TCSRD	Tata Chemicals Society for Rural Development
UN	United Nations
WTI	Wildlife Trust of India

INTRODUCTION

India, which is celebrated for its vibrant ecosystems and diverse wildlife, is at a critical juncture in safeguarding its environmental well-being amidst rapid economic expansion. While prosperity burgeons, so do substantial ecological burdens, demanding a delicate balance between growth and environmental stewardship for India's present and future.

This imperative is accentuated when examining specific regions such as Gujarat, a state distinguished by its industrial prowess and rich cultural heritage. Gujarat's industrial belt, a significant contributor to India's GDP, grapples with maintaining ecological equilibrium, exemplified by the Okhamandal region.

Okhamandal, nestled in western Gujarat, boasts abundant natural resources and ecological diversity, including coastal plains, mangrove forests, and fertile agricultural lands. Despite its ecological significance, Okhamandal encounters formidable challenges hindering sustainable development and environmental conservation.

These challenges, stemming from both geographical and socio-economic factors, are multifaceted:

Coastal Vulnerability: Okhamandal's coastal areas are acutely vulnerable to erosion and degradation, exacerbated by rising sea levels, climate change, and unsustainable coastal development practices. These threats imperil local ecosystems, livelihoods, and infrastructure.

Biodiversity Loss: The rich biodiversity of the region is imperiled by habitat destruction, pollution, overexploitation of natural resources, and the encroachment of invasive species. Such losses undermine ecosystem resilience and long-term sustainability.

Water Scarcity: The pressing issue of water scarcity in Okhamandal is compounded by erratic rainfall patterns, over-extraction of groundwater, and pollution of water sources. Access to clean and reliable water is indispensable for human populations and ecosystem vitality.

Deforestation and Land Degradation: Rampant deforestation, land degradation, and soil erosion, driven by agricultural expansion and unsustainable land-use practices, afflict Okhamandal. Addressing these challenges is paramount for preserving soil fertility, preventing erosion, and conserving biodiversity.

Community Vulnerability: Socio-economic disparities, inadequate infrastructure, and limited access to essential services such as healthcare and education heighten the vulnerability of communities in Okhamandal. Empowering these communities and bolstering their resilience to environmental and socio-economic adversities are pivotal for sustainable development.

In confronting these multifaceted challenges, concerted efforts are imperative to ensure the harmonious coexistence of economic prosperity, water conservation and environmental sustainability in Okhamandal and beyond.

Project Introduction

TCSRD implemented various initiatives between FY 2020-21 and 2022-23 through its CSR programs to attain sustainable development across the Okhamandal region in Gujarat. The organization believed social, economic, and environmental well-being were crucial for lasting positive change. These three pillars formed the cornerstone of their approach, guaranteeing their programs' effectiveness and enduring impact.

Specific interventions under each theme are outlined below:

Themes	Interventions
Water Conservation	**Jal-Dhan** Community Water Harvesting Structures to collect rainwater and improve the water table. Individual Water Harvesting Structures at farmlands Micro Irrigation System (MIS) & Rain Gun System to improve water efficiency
Centre for Sustainable Conservation Action for the Protection of the Ecosystems of the Seas (C-SCAPES)	• Coral Reef Recovery Project: In collaboration with the Wildlife Trust of India and the Gujarat Forest Department, TCSRD worked to restore the coral reef in the Mithapur region. • Mangrove Plantation: Restoration of mangroves for coastal protection. • Save the Whale Shark: The Project concentrated on conserving majestic whale sharks on Gujarat's coastline, which was done in collaboration with WTI.
Greening Projects	• Indigenous Flora Biodiversity Conservation - Biodiversity Park: Creating havens for native flora by establishing a biodiversity park that cultivates and conserves indigenous plant species.
Awareness and Training	• ECO Clubs: The project involved 56 student clubs to act as environmental stewards. • Prakruti Parivar: The program, implemented in the TCL township and surrounding communities, engaged residents and cultivated a culture of environmental responsibility. • Green School Programme: Green School Programme focused on environmental awareness and education among students

Sampling

A convenient sampling method was used to identify the participants for the study. The sample population for each intervention is given below.

Location	Sub-Theme	Project Name	Methodology	Achieved	
				Key Informant Interviews	Focus Group Discussions
Okhamandal and Kalyanpur blocks - GJ	Water Conservation	1. Jaldhan - Watershed development structures (approx. 4000 nos) Irrigated area (approx. 20,000 acres) Farmers covered through irrigation (approx. 8,000 farmers) - Roof Rainwater Harvesting System (Mithapur) Houses covered - 636	Qualitative Assessment with on-Field Visits	Sarpanch (5) RRHWS (6)	FGD-3
Mithapur - GJ	Centre for Sustainable Conservation Action for the Protection of the Ecosystems of the Seas (C-SCAPES)	Coral Reef Recovery Project	Qualitative Assessment	Expert (1)- WTI	Fishermen community (1)
Mithapur - GJ		Mangrove Plantation	Qualitative Assessment	Project team (1)	
Mithapur - GJ	Greening Projects	Indigenous Flora Biodiversity Conservation - Biodiversity Park	Qualitative Assessment with on-Field Visits	Project team (1)	
Mithapur - GJ		Tree Plantation Programme - creation of biodiversity parks, plantation and densification	Qualitative Assessment with on-Field Visits	Project team (1)	

Mithapur - GJ	Awareness and Training	ECO Clubs Program- school children (56 clubs)	Qualitative Assessment with on-Field Visits	Teacher (5)	Students (5)
GJ coastal areas		Save the Whale Shark Project	Qualitative Assessment with on-Field Visits	Experts (1)-WTI	Fishermen (1)
TCL township		Prakruti Parivar - implemented in the TCL township and around community members	Qualitative Assessment with on-Field Visits		Township residents (1)

Table 1: Primary Research Sampli

Within the Ensuring Environment Integrity theme framework, the study has been segmented into four specific areas: Jaldhan, C-SCAPES, Greening Project, and Awareness and Training. The research findings have been structured into sections for each sub-theme. These sections will explore the project's progress over the years, achievements, findings from primary interactions, a list of successful practices, areas for improvement, and suggestions. The conclusion will consolidate critical insights from each section.

Section 1 : Jaldhan (Watershed)

The Jal-Dhan Programme, implemented by TCSRD in Mithapur, a coastal region, addressed the critical issue of water scarcity exacerbated by water salinity and erratic rainfall. TCSRD aimed to enhance water availability and management within the community through comprehensive interventions. This intervention by the team is of significant importance, as it has enabled farmers to access water for agricultural purposes and livestock rearing. This access to water has played a crucial role in boosting agricultural productivity and consequently increasing farmers' income.

Community Water Harvesting Structures

A pivotal intervention entailed the renovation of community water harvesting structures such as ponds, which naturally accumulated rainwater, replenished groundwater, and served as a barometer of the village's water table. Community engagement and contributions, coupled with TCSRD's initiatives, were instrumental in this renovation process, substantially augmenting water storage capacity and alleviating water scarcity.

Individual Water Harvesting Structures

Additionally, individual water harvesting structures such as farm bunds were constructed around farmlands to capture rainwater, preserve soil moisture, prevent erosion, and safeguard fertile soil. Farmers also established ponds and bunds to store water for agriculture, reducing dependence on monsoons and groundwater.

Each year, the TCSRD team had a predetermined number of structures to construct in the area. Beneficiaries were selected based on criteria including need and their ability to bear the cost of construction. In the fiscal year 2022, TCSRD constructed a total of 161 small structures and 21 medium structures. Figure 6 provides a detailed overview from fiscal year 2017 to fiscal year 2023.

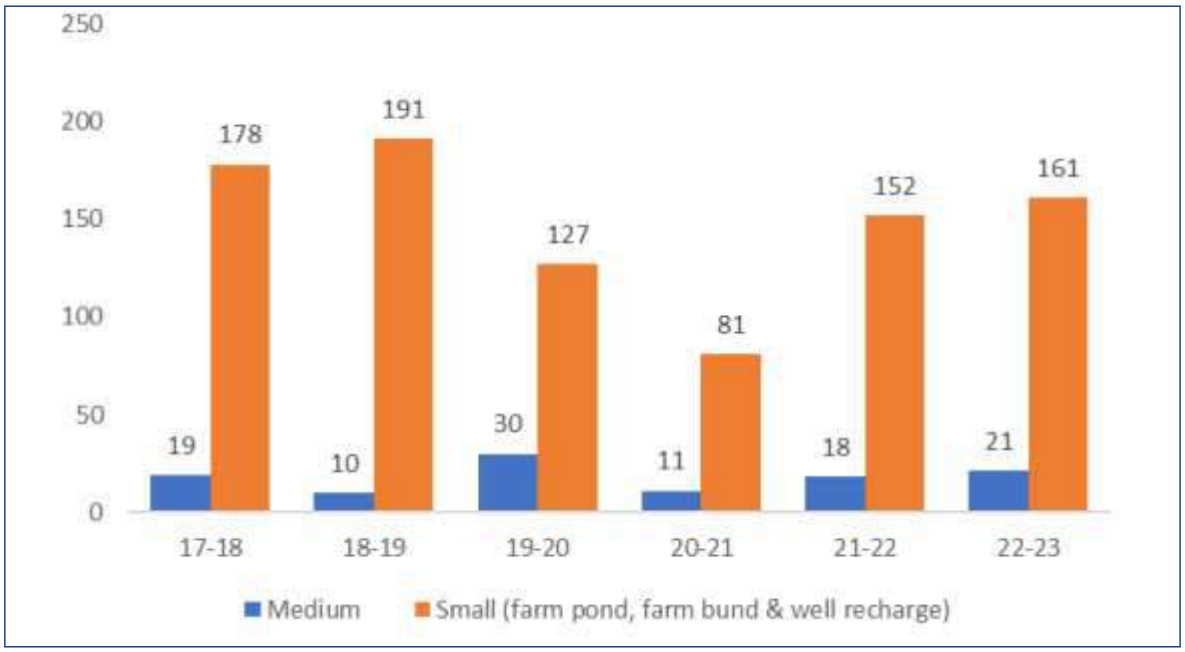


Figure 1: Number of Small and Medium structures constructed From FY 2017 to FY 2023

Micro Irrigation Systems (MIS) and Rain Gun Irrigation:

Furthermore, TCSRD actively promoted micro-irrigation systems (MIS) like drip and sprinkler irrigation to enhance water usage efficiency. During FGD, farmers admitted that Approximately 3 lakh litres of water are saved per hectare per season through the implemented practices.

Farmers in project villages received an additional 20% subsidy to incentivize the adoption of MIS. The rain gun irrigation system was also advocated for its affordability and low maintenance, providing a swift and effective irrigation solution suitable for small landowners and farms. The installation of drip and sprinkler systems by TCSRD has shown a notable increase since 2018. Figure 2 illustrates the increase in installations from 15 in 2017 to 210 in FY 2022. This upward trend indicates a growing inclination among farmers towards adopting water-efficient practices for agriculture.

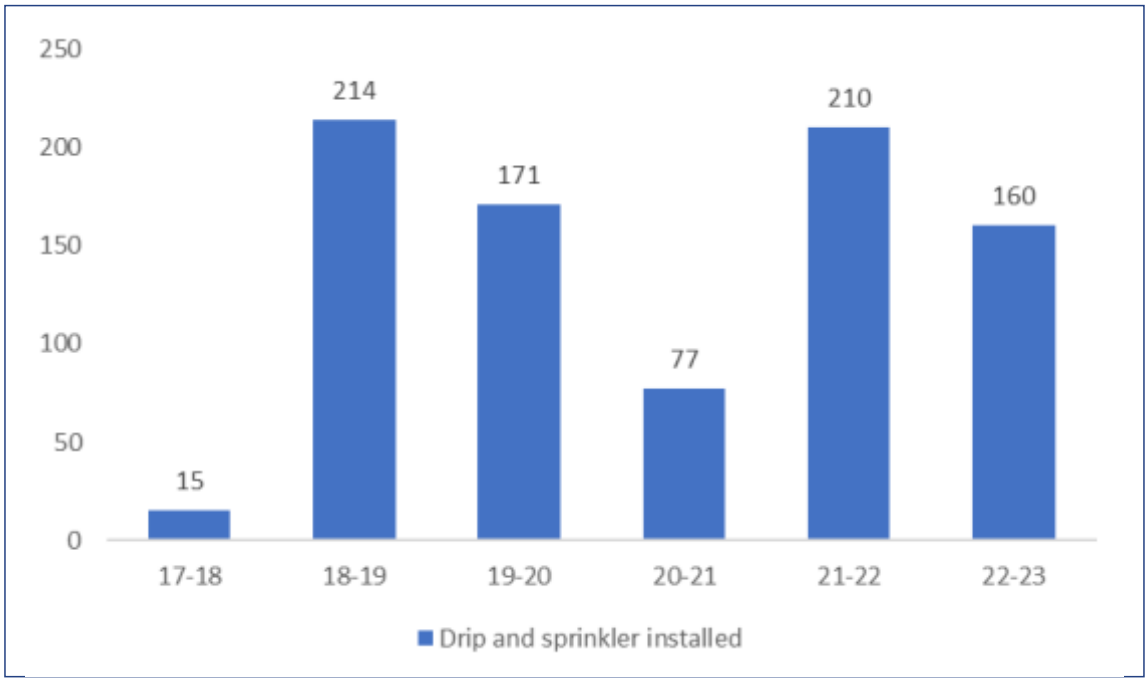


Figure 2: Number of Installation of Drip and Sprinkler from FY 2017 to FY 2023

In addition to the impact observed through the ground-level inception, the study engaged with the farmers, village sarpanches, FPO representatives, and other stakeholders of the projects and realized that the collaborative efforts between TCSRD and local communities have brought about transformative changes in agricultural, livestock, and water-related activities across the intervening villages.

Livelihood Sources and Agricultural Practices : Sarpanches and farmers underscored that agriculture was the primary source of livelihood for the majority of the village population, with traditional practices predominantly relying on monsoon crops like jowar and bajra.

"The primary occupation of up to 90-95% of the villagers is agriculture and also people depend on animal husbandry." - Sarpanch, Goriyar Village.

Land Size, Crop Diversity, and Irrigation Management: Farmers own varying land sizes, ranging from 20 to 45 bighas, currently cultivating crops like coriander, cumin, groundnut, coconut, and gram. Traditional irrigation methods were prevalent but with project interventions, practices like drip irrigation, sprinkler systems, and farm ponds have been adopted, leading to improved water management and increased cultivation in all seasons.

Awareness and Implementation: Sarpanches in villages such as Vasai and Goriyari praised TCSRD for its proactive approach to spreading program awareness, notably tackling water scarcity issues with initiatives like farm ponds and sprinkler systems. Farmers learned about the project through village gatherings, communication from the Sarpanch, and direct interactions with TCSRD personnel. Recognizing the project's importance stemmed from the need for agricultural knowledge, leading to high costs and meagre incomes. Consequently, farmers eagerly embraced the project to access new technologies, farming techniques, and subsidies.

"TCSRD staff visited the village to introduce their program and organized groups of farmers. They explained that by joining these groups, farmers would receive valuable farming information, access to new technologies, training sessions, and subsidies." - Farmer, Vasai village.

Beneficiaries and Necessity of Interventions : The programs have benefitted up to 70% of village farmers by addressing critical needs such as water scarcity, limited agricultural knowledge, and crop diversity issues, as acknowledged by Sarpanches and farmers alike.

"The program conducted by TCSRD has been essential for the farmers. Previously, farmers lacked access to agricultural information, resulting in limited crop cultivation. Now, with access to agricultural knowledge, farmers are growing a wider variety of crops." - Sarpanch, Tupani village.

Community Engagement : All the stakeholders highlighted the active community participation in planning and implementing activities, showcasing trust and commitment towards the development initiatives facilitated by TCSRD.

Impactful Activities : Tailored interventions, ranging from subsidies for coconut plantations to the adoption of sprinkler systems and farm ponds, have been implemented in each village to address specific water needs. Coconut farming yields approximately 40% higher income per acre for farmers compared to conventional crops. The cost of production, including labor, seeds, and pesticides, is also significantly lower. With the rise in tourism activities in the area, there is a high demand for coconuts for drinking purposes, further boosting the profitability and demand for coconut farming. Farm ponds without boundaries offer greater benefits to farmers. Without a boundary, fertile soil accumulates in the farm pond. When water is lifted from the pond for irrigation, the bottom of the pond yields rich, fertile soil, often referred to as "black gold" by farmers. Farmers collect this nutrient-rich soil and apply it to their fields, enhancing soil fertility and crop productivity.

These initiatives have effectively boosted agricultural production and financial security for farmers. The interventions have led to significant increases in agricultural output, ranging from 20-25% to 40-50%, attributed to advancements in agricultural practices, enhanced water management, and crop diversification. Furthermore, initiatives like establishing farm ponds and offering subsidies have encouraged expanded cultivation and strengthened financial resilience among farmers. By providing subsidies for various inputs such as fertilizer, seeds, drip systems, and farm machinery, the project has significantly contributed to improved agricultural practices and higher crop yields. Due to these interventions, farmers have experienced reduced water consumption, improved pest management, expanded crop variety, and enhanced productivity.

"Due to the information and new technology provided by TCSRD, there has been a 20-25% increase in production in the village. After disseminating this information, the percentage of farmers engaged in agriculture has risen from 40% to 60%. Specifically, knowledge about coconut cultivation and the availability of subsidies has increased coconut farming. Previously reliant on monsoon farming, farmers have now adopted practices like khet talavadi, drip, and sprinkler irrigation, enabling year-round farming. TCSRD has offered a 50% subsidy on medicine and a 40% subsidy on seeds, benefiting 195 farmers in the village. Additionally, the government provides a 70% subsidy, supplemented by a 12% subsidy for pipeline installation." - Sarpanch, Vasai village.

Challenges Faced and Solutions Implemented: Farmers encountered difficulties such as wild animal threats, climate risks, and a lack of nearby markets for selling crops. However, through collaboration and support from TCSRD, solutions like installing threshing machines, implementing crop insurance, and exploring new income sources such as vegetable cultivation and flower farming were explored.

"Previously, crops were susceptible to damage by wild animals. However, crop protection improved after installing a threshing machine, leading to increased production. Furthermore, farms began collecting water from ponds, enabling year-round cultivation and boosting income levels." - Farmer, Korada village.

"The absence of a nearby market for selling crops necessitates traveling to distant markets, which increases transportation costs. Additionally, adverse weather conditions can damage cumin crops, affecting their yield." - Farmer, Tupani village.

Feedback and Suggestions: Valuable feedback and suggestions provided by villagers include increasing the size of farm ponds, facilitating horticulture information, and improving market access, reflecting the evolving needs and priorities of the communities.

"TCSRD has built a khet talwadi capable of irrigating 10 bighas of land. Expanding the size of the khet talwadi would allow for the cultivation of more land and a greater harvest of crops. Additionally, there is a desire to grow vegetables, but the absence of a nearby vegetable market poses a challenge." - Farmer, Korada village.

Future Plans for Village Development: Plans outlined by both Sarpanches and Farmers include a focus on horticulture, improving market access, constructing borewells, and continued soil testing, emphasizing the importance of sustained engagement for holistic village development.

"Village farmers pay more attention to horticulture. For that, provide complete information on horticulture and subsidy in fertilizers, medicine, seeds." - Sarpanch, Vasai village.

"Borewells should be constructed as there is less water for agriculture. Borewells will provide sufficient water, which can be used for more farming. Farmers want to do borewells if they get subsidy for borewells." - Sarpanch, Tupani village.

Recommendations for Overall Village Development: Recommendations shared by both groups underscore the need for comprehensive support mechanisms, including crop insurance, borewell subsidies, market facilitation, and agricultural diversification, to ensure the long-term sustainability of village development.

The Jaldhan activities encompassing the establishment of farm ponds, community water harvesting structures, and micro-irrigation systems empowered farmers to cultivate multiple crops annually, thereby enhancing the dependability of their yields and augmenting income generation through sustainable farming practices. Beyond the economic advantages for farmers, these water management initiatives supported the flourishing of flora and fauna in the area, fostering biodiversity and making significant contributions to local environmental enhancements.

The collaborative efforts between TCSRD and the communities have significantly improved water conservation and overall community development. However, ongoing support and interventions are crucial to address emerging challenges and capitalize on new opportunities for sustained growth and prosperity in rural areas.

1.2. Analysis

Parameters	Description
Relevance	• Water management activities occurred in the Gujarat coastal region around Mithapur. The area is characterized by sandy soil, with a saline water table within a few meters below the surface. This posed challenges for villagers, of which 95% depended on farm-based livelihoods and animal husbandry. The project aimed to improve the family incomes and reliability of farming and animal husbandry as a livelihood through the relevant interventions across the surrounding villages of Tata Chemical Factory in the Mithapur region.
Effectiveness	• Over the three-year intervention period from 20-21 to 22-23, the project has introduced new farming technologies, helped farmers acquire knowledge, formed farmer collectives for availing various services, and water management to achieve the overall development of farm-based livelihoods, and in turn, achieved its objectives of bettering family incomes and providing sustainable livelihoods.
Efficiency	• The interventions have greatly enriched farmers within the project period by facilitating extensive knowledge transfer, widespread technology dissemination and water conservation techniques. These initiatives maximized available human resources and forged collaborations with diverse organizations to extend reach and scale. Subsidies provided through the project enabled farmers to engage in horticulture, thereby reducing input costs. As a result, the project efficiently utilized funds to promote economic stability among farmers and their families.
Coherence	• The project focused on solving water issues through farm ponds and community harvesting structures, increasing water availability and impacting microclimate. • The sub-theme of Agriculture, Livestock, and Water Management activities contributed to 8 UN SDGs such as SDG 1, 2, 6, 8, 9, 12, 13 and 15. • The project successfully contributed to the previous efforts by TCSRD and enabled opportunities for collaborations locally and nationwide.
Impact	• The project invested in capacity building of farmers and introduced better agri practices, crop diversity, and water management practices, which resulted in an estimated additional income generation of 30-40%. • The Jaldhan activities enabled farmers to take up multiple crops in a year, and the water helped the drinking needs of animals and helped in microclimatic conditions to positively impact the local environment.

Sustainability	• With the improved awareness of water management, the project has addressed the pressing and long-term needs of the villages by not just intervening in immediate needs but building capacities of the farmers, and the community to propagate the positive impact. • The project's Long-term sustainability is evident as it increased availability of water facilities, and efficient water usage among the farmers.

Table 2: Analysis across REECIS parameters

1.3. Practices Worked Well & Can Be Improved

Jaldhan	Selection of the Beneficiaries	The selection process conducted by the team ensured that beneficiaries were identified based on their genuine need for assistance and their willingness to contribute to the construction cost.	
	Construction of farm pond for farmers	The construction of farm ponds has proven immensely beneficial for farmers regarding water conservation and storage. This stored water was effectively utilized for agricultural purposes, enhancing agricultural productivity.	
	Desilt and Renovation of community ponds in the villages	The team's efforts in desilting the old village ponds have yielded multiple benefits. This initiative increased groundwater levels and storage capacity, providing a valuable water source for local farmers to use in agriculture. Additionally, the rejuvenation of these ponds contributed to the restoration of biodiversity, thereby fostering a more balanced ecosystem.	

Table 3: Output Achievement Matrix of Jaldhan (Water Conservation Program)

1.4. Recommendations

1. Collaboration with government schemes: Primary interactions reveal a notable gap in collaboration with government schemes. While farmers are aware of central government initiatives, they need to leverage the benefits they provide fully. Offering assistance to farmers in navigating the application process for these schemes could significantly enhance their ability to access and benefit from this convergence.

2. Construction of a Safety wall around the Individual Farm Pond: Beneficiary interactions indicated that silt was carried away with water flow, posing a challenge for farm ponds. To address this issue, a safety wall around the farm pond is recommended to prevent silt from entering and contaminating the water.
Each year, the depth of the farm pond decreases due to silt accumulation. As a result, farmers need to periodically repair and maintain the farm pond to restore its original depth and capacity.

3. Promotion of Solar-based Lift Irrigation: Insufficient electricity disrupts irrigation operations, impacting agricultural activities. To mitigate this issue, transitioning to solar-powered lift irrigation is proposed. This solution not only addresses the problem but also offers environmental sustainability and cost-effectiveness, benefiting the farmers in the region.

Section 2 : Centre for Sustainable Conservation Action for the Protection of the Ecosystems of the Seas (C-SCAPES)

2.1. Overview & Impact

2.1.1 Coral Reef Recovery Project

Launched in 2008 and continuing during the assessment period between 2020 and 2023, the Coral Reef Recovery Project focused on preserving coastal and marine biodiversity while fostering sustainable livelihoods tied to ecosystems, notably the Mithapur reef in Gujarat. By implementing measures like building artificial reefs, creating coral gardens, and engaging the reef-dependent fishing community in conservation activities, the project sought to improve the reef's relatively low coral cover. Spearheaded by a partnership between the Wildlife Trust of India, Tata Chemicals Limited, and the Department of Forests, Government of Gujarat, the project's execution was overseen by the Wildlife Trust of India (WTI).

Covering an area of about 5 square meters arranged in clusters, the project brought direct and indirect benefits to approximately 190 fishermen families by involving 190 artisanal reef fishers from nearby villages. Key implementation efforts involved setting up a bio-rock system, constructing 775 artificial reefs, and expanding the total artificial reef area by 4851 square meters, with 1968.5 square meters added between 2020-23. These initiatives played a crucial role in boosting fish populations, leading to a tenfold increase in fish catch. This significant rise in catch directly improved the livelihoods of the local communities.

Furthermore, between 2020 and 2023, the project commenced the creation of two coral gardens, serving as vital repositories for locally abundant coral species, crucial for future coral reef restoration efforts. Rigorous monitoring studies were regularly conducted to monitor changes, and designated no-take zones for fishing were established to protect the newly formed coral reefs and maintain coral reef cover.

The study involved interactions with local fishermen, project experts, and the WTI project team. It was found that the Coral Reef Recovery Project initiated by TCSRD was crucial for the local fisherman community, revealing the intricate link between coral reefs and fish populations.

A marine expert from WTI highlighted the concerning state of the coral reefs before introducing the coral reef recovery project in the Mithapur region. He explained that coral reefs are crucial ecosystems, providing habitats for diverse marine life and earning them the nickname "rainforests of the sea." However, the baseline assessment before the project initiation revealed a troubling reality: live coral coverage was remarkably low at 12% in 2004 in the Mithapur coastal region. This deficiency in live coral directly impacted the area's variety of fish and coral species, emphasizing the need for conservation efforts to restore these vital marine habitats.

A young fisherman voiced concern about the declining fish populations affecting their livelihoods along the coastal areas before the project introduction. He highlighted the positive impact of TCSRD's introduction of artificial corals, which increased fish presence in those regions.

“The depletion of coral reefs directly impacted fish populations, affecting our daily livelihood. With fewer fish, our sustenance was threatened. Fortunately, TCSRD initiated a coral reef program. They introduced self-made corals into the water, and fish began congregating in the area. This intervention provided hope for our community's future.” - Young fisherman aged 23

Over time, there has been a steady increase in both fish stock and diversity. Observations have revealed nine new fish species, seven of which have been officially recorded. Additionally, five species of seahorses have been identified, along with the recognition of four new varieties of soft coral. Seahorses and soft corals are valuable indicators of water quality.

List of new fish species recorded

Sr No	Fish Species
1	Pearl Spot Chormis
2	Five-lined Cardinalfish
3	Moon Wrasse
4	Spangled emperor fish
5	Russels Snapper
6	Four Lined Terrapon
7	Black-tailed snapper

Another community member emphasized the educational aspect of the project, where TCSRD explained the importance of corals in attracting fish. This knowledge instilled hope for the future of fishing livelihoods.

“In the past, we treated corals as mere stones, breaking them without understanding their importance. However, after learning about the significance of corals, we began to appreciate and preserve them.” - Fisherman-aged 47.

However, some fishermen highlighted the inconvenience of fishing restrictions in coral reef areas but recognized the long-term benefits as fish populations thrived around the corals; they observed the symbiotic relationship between fish and coral, noting how fish found shelter and multiplied around coral habitats, revitalizing fish populations.

“Because of the coral reef project, fishing is restricted in specific areas, forcing us to venture farther out to catch fish, resulting in financial losses. However, we've noticed that as fish make their homes within the coral, their populations thrive, creating a flourishing ecosystem around the coral reefs.” - FGD of Fishermen.

“In a first-of-its-kind global initiative for a no-take zone, prohibiting fishing activities entirely. The local fishermen community has embraced this concept, leading to the establishment of a 100,000 square meter area designated as a no-take zone in Mithapur, marking a pioneering effort in India.”- WTI Expert.

Personal anecdotes from two decades ago recalled abundant fish populations and healthy coral reefs in the region. There was also a plea from the older fishermen to involve youth in coral reef preservation efforts to ensure future generations safeguard coral ecosystems for sustainable fishing practices.

The fishermen advocated for greater awareness about the impacts of destructive fishing practices and the importance of coral conservation for long-term viability. They stressed the importance of preserving coral reefs for future generations, emphasizing the need for sustained engagement and education among their community.

"Educating the youth about this project is crucial for conserving corals. Additionally, providing information about sustainable fishing practices like crazefishing can benefit fishermen financially. TCSRD should involve more fishermen in this program and raise awareness about coral reefs. Fishing activities should be avoided where coral reefs are present to ensure their protection and preservation for future generations." - FGD of Fishermen.

Discussions with stakeholders highlighted the TCSRD's Coral Reef Recovery Project as a driving force for change, enhancing understanding of the correlation between coral reefs and fish populations and facilitating the colonization of new marine species along the coastline. The project can aim to empower youth by involving them in project initiatives and garnering community support for sustainable practices to safeguard coral reefs independently without external support in the future. This effort can be further bolstered by advocacy for supportive policies from local government authorities. By prioritizing education, conservation efforts, and community involvement, the project can ensure the long-term viability of fishing in the area while preserving vital coral ecosystems for future generations.

2.1.2. Save the Whale Shark Project

The Save the Whale Shark Project, initiated in 2004, aimed to raise conservation awareness and gain support from coastal communities, mainly targeting fishermen in Veraval, Gujarat, India. This project was implemented in partnership with the Wildlife Trust of India and the Gujarat State Forest Department, with active participation from fishing communities. Over the period from 2020 to 2023, the project successfully rescued and released 159 whale sharks incidentally caught in fishing nets (as depicted in Figure 3).

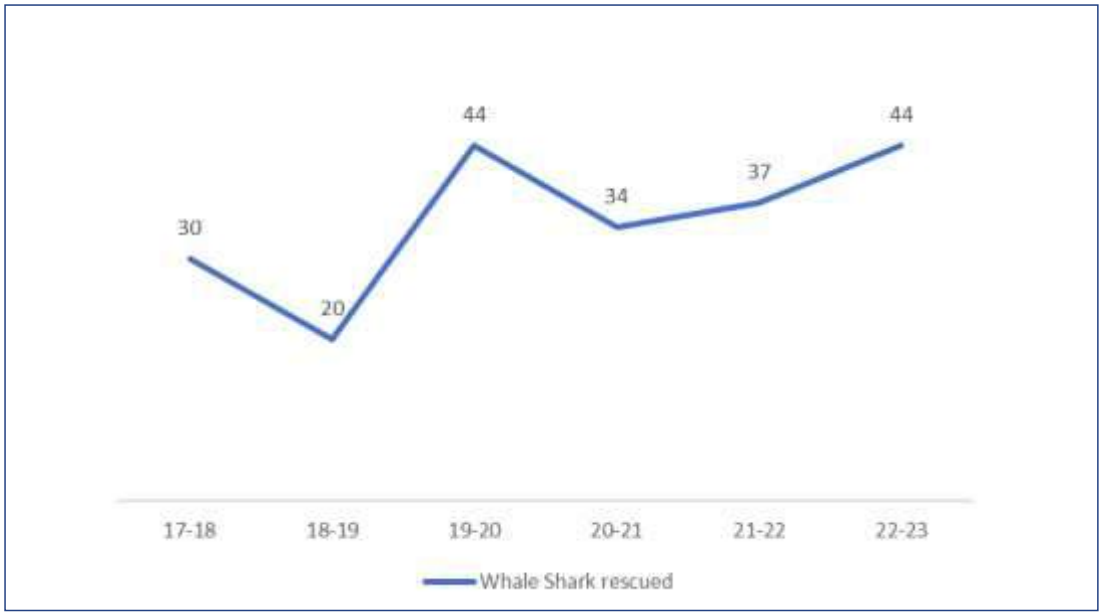


Figure 3: Total number of Whale Shark rescued from FY 2017 to FY 2023

Interventions to foster community participation were implemented to establish a long-term and sustainable marine conservation model. These initiatives included satellite tagging and biological research studies on migration patterns, which helped establish connections between regional populations of Whale Sharks traversing the Arabian Sea.

One crucial aspect of the project involved ensuring the safe and prompt release of all accidentally entangled Whale Sharks from fishing nets. This was achieved through the implementation of two primary strategies:

1. Raising awareness and sensitizing the fisher community, coastal school students, and youth about the importance of Whale Sharks.
2. Conducting rescue operations for entangled Whale Sharks.

Between FY 2020 and 2023, the project's awareness programs reached 10,000 fishermen and 25,000 coastal students.

Furthermore, the forest department provided monetary relief to fishermen for net damages incurred during rescue operations. They also established the annual celebration of Whale Shark Day. Ongoing research on whale shark biology, including feeding, breeding, and migratory patterns, further contributed to conservation efforts.

The "Save the Whale Shark" project emerged as a ray of hope for marine conservation, striving to protect this vital species while actively involving local communities. Insights from discussions with experts from WTI and fishermen shed light on various aspects:

WTI experts emphasized the project's significance in preserving marine biodiversity and fostering awareness among fisher communities regarding broader environmental issues. They highlighted its alignment with corporate social responsibility objectives, particularly in conservation and stakeholder engagement.

The tangible project outcomes include enhanced reporting of whale shark sightings and successful advocacy efforts that prompted governmental regulations for their protection. These accomplishments and community empowerment initiatives have significantly influenced attitudes towards whale shark conservation. According to fishermen, targeted training and awareness programs effectively heightened awareness about whale shark conservation. These efforts offered valuable insights into marine conservation, leading to observable shifts in fishing practices and attitudes.

"The training and awareness initiatives have effectively contributed to conserving whale shark populations and their habitats. Furthermore, active community involvement in conservation activities has positively influenced the attitudes and behaviors of the fisher community toward whale shark conservation." - WTI Expert.

The project achieved a significant impact by involving various stakeholders through capacity building and encouraging community ownership to ensure sustainability in the long run. TCSRD aimed to empower stakeholders to continue leading conservation initiatives even after the project ended, safeguarding the future of whale sharks and marine ecosystems.

While financial constraints limit scalability and impact, strategic resource allocation is essential for sustaining and expanding conservation activities. Also, fishermen stressed the importance of robust monitoring, evaluation mechanisms, and government backing for sustainability.

TCSRD's "Save the Whale Shark" project showcases the power of collaboration in marine conservation,

driven by a shared commitment to safeguard our oceans for future generations. The project continued to advance marine biodiversity protection and environmental sustainability through strategic partnerships and community engagement. Addressing recommendations such as securing government support at the policy level, continued monitoring of the whale sharks using tracking devices, and enhancing community livelihoods can further improve the project's impact on marine conservation and local community well-being.

2.1.3 Mangrove Plantation

The Mangrove Plantation project, initiated in 2010 near Rukmini Temple Creek in Dwarka, Gujarat, aimed to rejuvenate mangrove ecosystems while providing livelihood opportunities for local communities. Spanning approximately 50 acres, the project primarily benefited the nearby fishermen's community. Its main objective was planting mangroves, precisely the Avicennia marina variety. Between 2020 and 2023, 150,000 mangroves were planted in Mithapur through collaboration with the forest department and community engagement efforts (Figure 4).

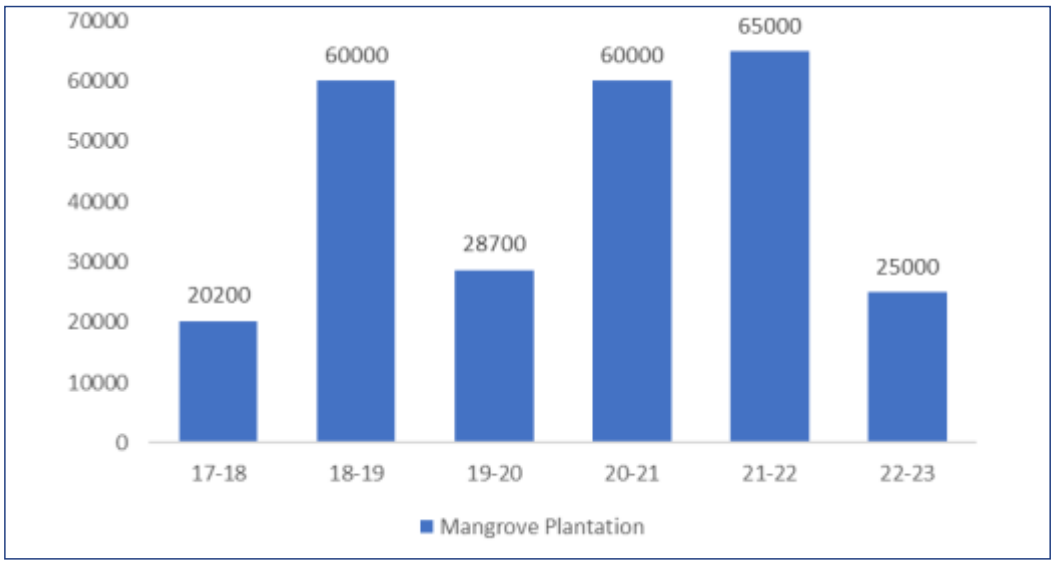


Figure 4: Number of Mangrove plantations from FY 2017 to FY 2023

Mangroves offer numerous advantages critical to both coastal ecosystems and human communities. Firstly, they serve as natural buffers against coastal erosion and storm surges, shielding coastal communities from natural disasters. Their dense root systems stabilize shorelines and mitigate the impact of waves and tidal currents. Additionally, mangroves serve as vital nurseries for various marine species, including fish and crustaceans, supporting local fisheries and biodiversity. Furthermore, they play a significant role in carbon sequestration, storing large amounts of carbon in their biomass and sediments aiding climate change mitigation.

Moreover, mangrove forests act as natural filters, trapping pollutants and enhancing water quality. Their intricate root systems also trap sediments, preventing them from entering coastal waters and damaging coral reefs. Additionally, mangroves provide recreational and ecotourism opportunities, attracting visitors interested in their unique biodiversity and natural beauty.

The cultivation of the Avicennia marina variety mangrove took place in the in-house nursery with government authorization. Ongoing efforts were made to identify additional suitable locations for planting in the area. Regular monitoring of the plantations occurred twice a week, including assessments of mangrove growth and mortality. Measures were taken to clear algae collected around the mangroves, which could affect their roots and growth. Also, precautions were in place to ensure fishermen's boats did not disturb the plantation area. Furthermore, fishermen were provided with awareness regarding the importance of these plantations.

However, challenges arose in 2022-23 when the government denied permission for a mangrove plantation, impacting TCSRD's efforts. Despite these setbacks, TCSRD remains committed to its goals. They continue to sustain the project's momentum by operating an in-house nursery for mangrove cultivation. They are working towards obtaining the necessary approvals to resume plantation activities and ensure the project's continuity.

Based on direct interactions with the project team and ground visits, the study noted that the project objectives closely matched the needs and priorities of the local community and stakeholders. Initially recommended by the Forest Department after the 2006 tsunami, the mangrove forest now serves as a natural wall against the ocean waves.

The project made significant strides, boasting a 50% survival rate for planted trees and enhancing overall land conditions by mitigating soil erosion. Flora and fauna readily embraced the mangrove forest, indicating successful adoption. Moreover, there was a notable increase in both the quantity and diversity of fish and the establishment of sustainable habitats for migratory birds and marine life.

"Currently, we can witness the thriving flora and fauna that have adopted the mangrove forest. This ecosystem has contributed to land improvement and has significantly reduced soil erosion. Moreover, our planted trees have achieved a 50% survival rate." - Project Coordinator.

However, challenges persist, particularly concerning community awareness and involvement in protecting the plantation areas. The practice of fishermen parking their boats in mangrove areas has negatively impacted plant survival.

"We conducted experiments to develop new varieties of mangrove plants in our in-house nursery. As we strive to improve the project, we must emphasize raising community awareness about protecting the plantation areas. The practice of fishermen parking their boats in mangrove areas has directly impacted the survival of plants." - Project Coordinator.

Efforts to optimize project efficiency included utilizing an in-house nursery for sapling development and involving volunteers in plantation activities. However, there was room for improvement in raising community awareness and obtaining permission from relevant authorities for plantation activities.

TCSRD's Mangrove Plantation project near Rukmini Temple in Dwarka has played a crucial role in tackling environmental challenges and supporting coastal ecosystems in the region. Mangroves serve as natural infrastructure, shielding populated areas from erosion and storm surges during extreme weather events while also fostering biodiversity as vital ecosystems. Regular monitoring visits should be conducted to track mangrove development and mortality rates to ensure long-term sustainability. Additionally, strategies must be implemented to address potential threats like climate change and pollution. It's essential to educate the community about not parking boats near plantation areas to mitigate risks. Stakeholder recommendations for project enhancement included acquiring new land for mangrove plantation and strengthening collaboration with the Forest department to address challenges effectively.

2.2 Analysis

Parameters	Description
Relevance	• Located along the Arabian Sea coast, Mithapur and its surrounding areas are rich in marine biodiversity and face various environmental challenges. The coral reef recovery project helps restore and protect fragile coral ecosystems, which serve as habitats for numerous marine species, supporting local fisheries and maintaining biodiversity. Similarly, mangrove plantation initiatives contribute to coastal resilience by preventing erosion, mitigating the impacts of storms, and providing vital habitats for diverse flora and fauna. Furthermore, the Save the Whale Shark project addresses the conservation of this endangered species, an essential part of the marine ecosystem in the region. By focusing on these projects, the Mithapur region can enhance its environmental sustainability, protect marine biodiversity, and support the livelihoods of fishermen communities dependent on marine resources. • The project's relevance goes beyond addressing immediate ecological degradation. It aims to empower communities to become self-sufficient in caring for the marine ecosystem independently in the future, achieved through capacity building and raising awareness within the communities.
Effectiveness	• The project aimed to address several key issues in the area, including environmental degradation following the 2006 tsunami, low coral reef cover at 12%, unintentional deaths of whale sharks, and enhancing awareness, sensitivity, and livelihoods of the local fishing community through several interventions. • The projects undertaken as part of C-SAFE successfully achieved their objectives through sustained efforts spanning decades. During the current assessment period, these projects further reinforced previous endeavors by establishing new coral reefs, planting additional mangroves, and conducting awareness and capacity-building activities for fishing communities regarding marine life.
Efficiency	• The project primarily relied on locally sourced human and material resources and an in-house mangrove nursery to implement the coral reef recovery, whale shark conservation, and mangrove plantation projects within a budget of 106 lakh rupees over three years. This efficient utilization of existing infrastructure and local manpower allowed the project to

	manage expenses and ensure timely execution. The additional impacts achieved within the allocated budget over the three years are commendable, reflecting the project's effective resource management and tangible outcomes.
Coherence	• The projects seamlessly integrated with ongoing environmental conservation initiatives in the region, leveraging community resources and local government mechanisms to obtain necessary permissions and support. Notably, the Save the Whale Shark project gained recognition from the state government, receiving policy backing to raise awareness and facilitate the rescue and release of whale sharks. Similarly, the Coral Reef and Mangrove projects garnered support from local fishermen and involved establishing an in-house nursery in partnership with the forest department. The project effectively met community needs through collaboration with multiple organizations, enhancing existing practices and knowledge.
Impact	• The project facilitated the planting of an additional 125,000 mangroves across 50 acres of land, expanded coral reef coverage by 1701 square meters, and engaged 10,000 fishermen and 25,000 school children in raising awareness about whale sharks and the importance of their conservation. Furthermore, it significantly enhanced marine biology by achieving a tenfold increase in fish catch, discovering new fish and seahorse species, boosting whale shark sightings, mitigating land erosion, and enhancing flora and fauna habitats through mangrove plantation efforts. • These positive outcomes underscore the significance of the various interventions implemented under C-SAFE, which were crucial for the area. Additionally, they played a vital role in educating the local population about the benefits of these environmental activities.
Sustainability	• The capacity-building and awareness initiatives within local communities contributed to shifting behaviors and attitudes toward coral reefs, whale sharks, and mangrove maintenance. However, these activities remained reliant on external support. Continued community engagement and government policy backing are essential to enhance the project's future sustainability. Adequate human and financial support from the government is also crucial to ensure the continuity of the vital activities initiated by TCSRD, with continuous monitoring and evaluation.

Table 4: Analysis across REECIS parameters

2.3 Practices Worked Well & Not Working Well

Project	Activity	Worked Well	Can Be Improved
Coral Reef	Coral reef restoration program	Artificial coral reefs helped increase coral coverage, improving fish availability and diversity.	
	No take zone (restricted fishing area)	Restricted fishing activities in 1 lakh Sq mtrs to safeguard bio-rocks and the coral reefs have improved the fish population and reduced overfishing in the area.	
	Awareness and participation of the fishing community	Increased awareness and sensitization efforts among the fisher community have contributed to the restoration of coral reefs and an expansion in the coverage of live coral in the Mithapur region.	
Save the Whale Shark	Fisher Community Awareness program		The awareness activities can improve their reach and integrate the local youth into the awareness and outreach.
	App development and demonstration	The Vahali Watcher App assists fishermen in obtaining compensation by enabling them to document and photograph the release of whale sharks. This simplifies the release process without causing harm to the whale shark.	Currently, only 500 out of 10,000 fishermen have started using this app, and the app's functionality has been compromised due to insufficient funds for maintenance, necessitating support to resolve the issue.

	Compensation from the Forest Department		The fisher community's demotivation regarding their involvement in rescue efforts has stemmed from the rejection of compensation requests due to insufficient evidence for the release of whale sharks; this can be improved by correct training and giving how-to guides for the fishermen on applying for compensation.
	Conducting scientific studies	Scientific studies helped identify the possible whale shark aggregation hotspots relative to rescue locations. It also helped determine the significance of food availability for whale sharks in migrating to Gujarat waters.	
Mangrove Plantation	Mangroves Plantation	A significant expanse of 50-acre mangroves helped reduce soil erosion and improved marine biology.	Emphasis should be placed on the growth of mangrove forests and reducing mortality rates.
	In house nursery	Timely and quality mangroves are available, with reduced independence in the forest department and outside nurseries.	
	Community Engagement		Efforts should be made to provide alternatives for parking boats to eliminate the parking of boats in the mangroves.

Table 5: Outcome Achievement Matrix of Centre for Sustainable Conservation Action for the Protection of the Ecosystems of the Seas (C-SCAPES)

2.4 Recommendations

Coral Reef programme

1. Micro fragmentation: This technique should be applied to the coral reef program. It involves propagating corals through in situ coral nurseries using small amounts of wild-collected stock. The corals are fragmented into small pieces and allowed to grow in size. Once they reach an appropriate size, the corals are re-fragmented or planted onto degraded reefs. Subsequently, they are closely monitored for both growth and survival rates.

2. Alternative Livelihood: The coral reef program's implementation has resulted in fishing activity restrictions, reducing the available fishing area for the local fisher community. This could increase their reliance on the sea for sustenance. Promoting alternative livelihood options like crab farming is recommended to address this challenge. This approach would allow the fishing community to diversify their sources of income, lessening their dependence solely on fishing activities.

3. Restoration: Adopting bio-rock technology is crucial to achieve rapid growth of coral reefs. This innovative method utilizes mineralization techniques to accelerate coral growth. By employing bio-rock technology, the mineralization process stimulates the rapid development of coral reefs, fostering their growth and resilience.

4. Engagement of Youth: Involving the youth from fishing communities in awareness, outreach, and activity implementation will sustain the project with fewer resources and foster a sense of community responsibility among the population.

Save the Whale Shark

1. Revision of the project's objectives and budget: It's essential to review the project objectives and budget to ensure they align well with the needs and capacities of the implementation partner. Identifying areas where the partner needs the most support, especially regarding technical assistance for tools like the Vahali Watcher App and the Self-Documentation scheme. This alignment between the expectations of the donor and the implementation partner should inform the setting of project objectives and goals, ensuring effectiveness and efficiency in achieving desired outcomes.

Mangroves plantation

1. New site adoption and Improving the area of mangrove plantation: Mangroves, with their myriad benefits, act as natural carbon sinks, making them highly valuable for any organization's sustainability efforts, particularly within the Environmental parameters of ESG frameworks. Using the existing in-house nursery to establish a large-scale mangrove forest can significantly reduce TCL's carbon footprint. This initiative benefits the organization and contributes to the community's well-being and the environment at large.

2. Reduce mortality rate through effective Monitoring: To further enhance the commendable 50% survival rate, the team can implement more effective monitoring methods and engage local communities. Additionally, involving these communities can help mitigate illegal entries and unauthorized boat parking in the mangrove area.

3. Mangrove Plantation Environmental Impact Assessment: To ensure the effectiveness and sustainability of mangrove plantation initiatives, it is imperative to measure their environmental impact comprehensively. By implementing robust monitoring and assessment protocols, one can evaluate the success of mangrove plantation projects in contributing to ecosystem restoration and conservation efforts.

A thorough assessment should include monitoring the growth and development of planted mangroves, conducting biodiversity surveys to track changes in species composition, and quantifying carbon sequestration rates to gauge their role in mitigating climate change. Additionally, analyzing soil and sediment characteristics and monitoring water quality parameters is crucial for understanding the overall health of the mangrove ecosystem and its surrounding environment.

Furthermore, assessing the effectiveness of mangroves in controlling erosion and stabilizing shorelines, along with evaluating their socio-economic impacts on local communities, provides valuable insights into the broader benefits of mangrove conservation efforts.

Section 3 : Greening Projects

3.1. Overview & Impact of Projects

3.1.1 Indigenous Flora Biodiversity Conservation

Initiated in 2004, the Indigenous Flora Biodiversity Conservation project in Okhamandal aims at safeguarding local strains of native flora species within a 170-acre reserve area while fostering the breeding of local migrant bird species within a developed 25-acre dry deciduous forest patch.

The project's implementation in the assessment period involved assessing indigenous flora and fauna, developing saplings in the nursery and plantation, and identifying new bird species. Notably, from 2020 to 2022, 12 birds were identified, and ten new species of saplings were planted in the nursery, furthering the project's conservation objectives.

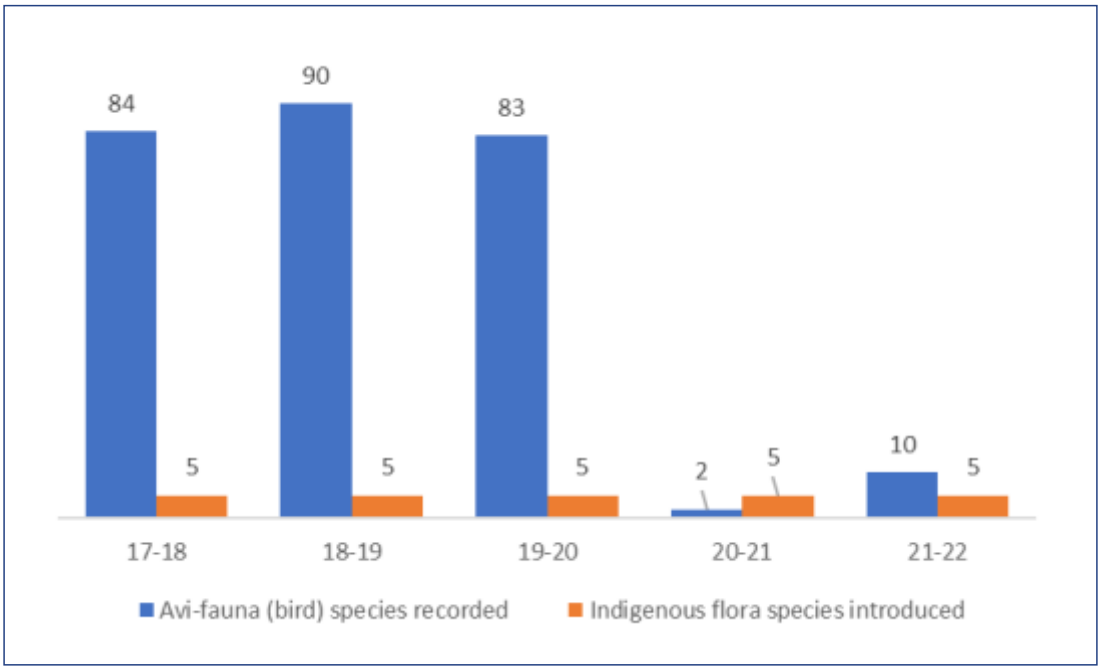


Figure 5: Total number of fauna recorded and Indigenous flora species introduced from FY 2017 to FY 2022

List of identified bird species

S. No	Birds Common name	Scientific name	Status
1	White-throated Munia or Indian Silverbill	*Lonchura malabarica*	Resident
2	Chestnut-tailed Starling	*Sturnus malabaricus*	Migratory
3	Common Redstart	*Phoenicurus phoenicurus*	Migratory
4	Northern Shoveler	*Spatula clypeata*	Migratory
5	Chestnut-bellied Sandgrouse	*Pterocles exustus*	Resident
6	Common Hawk-Cuckoo	*Hierococcyx varius*	Migratory
7	Black-naped Monarch	*Hypothymis azurea*	Uncommon
8	Red-backed Shrike	*Lanius collurio*	Migratory
9	Greater Whitethroat	*Curruca communis*	Migratory
10	Asian Brown Flycatcher	*Muscicapa dauurica*	Uncommon
11	Spotted Flycatcher	*Muscicapa striata*	Migratory
12	Tickell's Blue Flycatcher	*Cyornis tickelliae*	Uncommon

List of plant species

S. No	Plant Common name	Botanical name Family	Family
1	Amla	*Phyllanthus emblica*	*Phyllanthaceae*
2	Agave	*Agave americana L*	*Agave americana L*
3	Billi/Beal	*Aegle marmelos*	*Rutaceae*
4	Charal	*Holoptelea integrifolia Planch*	*Ulmaceae*
5	Drumstick	*Moringa oleifera*	*Moringaceae*
6	Guava	*Psidium guaiava*	*Myrtaceae)*
7	Gunda	*Cordia dichotoma*	*Boraginaceae*
8	Kingelia	*Kingelia Africana*	*Bignoniaceae*
9	Teak	*Tectona Grandis*	*Lamiaceae*
10	Umaro	*Ficus racemosa*	*Moraceae*

From the ground-level interactions with the project team, the project coordinator emphasized TCL's commitment to environmental conservation, highlighting the introduction of seven projects focusing on the preservation and conservation of local flora. The main objective was to protect and preserve 165 indigenous flora species within the Okhamandal region, aligning closely with the local community's needs.

"I perceive the relevance of the Indigenous Flora Biodiversity Conservation project as a means of giving back to Mother Earth. TCL introduced seven projects focusing on conservation and preservation, protecting and preserving 165 indigenous flora." - Project Co-ordinator

Specific activities demonstrating the project's effectiveness include the establishment of an in-house nursery for indigenous flora, the distribution of saplings to township residents and nearby villages, and the engagement of volunteers from the Prakruti Parivar in community-related activities.

"The project has established an in-house nursery of indigenous flora and its distribution to township residents and nearby villages, and also volunteers from Prakruti Parivar played a vital role in community-related activities." - Project Co-ordinator.

The project has largely achieved its goals of restoring and conserving biodiversity, with the restoration and conservation of 165 species of flora and eight types of reptiles identified in the township. Additionally, approximately 170 acres of land were transformed into a biodiversity park, resulting in more sightings of various bird species.

"The project converted approximately 170 acres of land into a biodiversity park, resulting in increased visibility of various bird species in the area. We also discovered eight types of reptiles in the township, indicating the success of the biodiversity project." - Project Co-ordinator.

The project effectively utilized resources by involving TCL employees, their families, and ex-employees in volunteer programs. However, challenges stemming from the proliferation of Prosopis juliflora (Ganda Bawal) impeded the restoration of indigenous flora. It's imperative to address the presence of this invasive plant species to facilitate the restoration efforts.

"One area where the project could improve efficiency is in addressing the growth of Prosopis juliflora (Ganda Bawal), which hindered the restoration of indigenous flora." - Project Co-ordinator.

The project has successfully conserved 165 indigenous flora species from initiation, with ten new species planted between 2020 and 2022. It also identified 12 new bird species and eight types of reptiles within the current assessment period. Strategies to mitigate potential threats have been implemented, such as using cacti as a boundary wall to prevent unwanted dwellings. Employee volunteering has also played a crucial role in carrying out project activities. The one area where attention is needed is to address the extraction of Prosopis Juliflora and implement preventive measures to control its future growth.

3.2 Analysis

Parameters	Description
Relevance	• The Okhamandal region, situated along the Arabian Sea coast in Gujarat, boasts a diverse array of flora and fauna, including both migratory and resident bird species. However, this biodiversity faces threats from invasive species like Prosopis juliflora, which disrupts native ecosystems and inhibits the growth of indigenous plants. To address this challenge, there is a pressing need to conserve indigenous flora to safeguard the numerous economic and environmental benefits they provide. Furthermore, environmental awareness initiatives are crucial in supporting biodiversity conservation by enhancing human capital and fostering community engagement in conservation activities.
Effectiveness	• The project successfully achieved its goal of restoring and conserving 165 indigenous flora species through the in-house nursery. Moreover, it effectively provided a sanctuary for various bird and reptile species, which now inhabit the 170-acre bio-park.
Efficiency	• Between 2020 and 2023, the biodiversity park efficiently allocated over 49 lakh rupees and utilized available human resources to restore and preserve new flora species while identifying new fauna. Furthermore, it managed to manage the existing reserve area and deciduous forest within the allocated budget.
Coherence	• The bio-park initiative began in 2007, and during the assessment period, several activities contributed to the overall objective of restoring and preserving indigenous species. This included planting ten new plant species and identifying 12 new bird species and eight new reptile species. Additionally, the project expanded its reach to nearby villages by providing saplings and conducting awareness drives and fieldwork in schools to impart practical knowledge on critical environmental aspects. The project integrated existing efforts with new initiatives to achieve a comprehensive impact and foster collaboration.

Impact	• The initiatives over the 170-acre reserve area and 25-acre deciduous forest patch led to the restoration and conservation of indigenous flora species. Additionally, new bird and reptile species found refuge in the forest. Furthermore, school children and other community members gained hands-on experience in various environmental aspects, impacting the local ecological system, biodiversity, and community engagement.
Sustainability	• Equipped with an in-house nursery spanning 170 acres, the project in Okhamandal diligently restores and preserves over 165 indigenous flora and fauna species. Although the reserve area has yet to yield tangible benefits for local communities, it has already become a nesting ground for both local and migratory birds. Additionally, it has fostered the growth of a forest rich in local flora, attracting other living species, such as reptiles. The ecological significance of the bio-park promises enduring positive outcomes for generations to come provided it receives adequate protection.

Table 6: Analysis across REECIS parameters

3.3 Practices Worked Well & Not Working Well

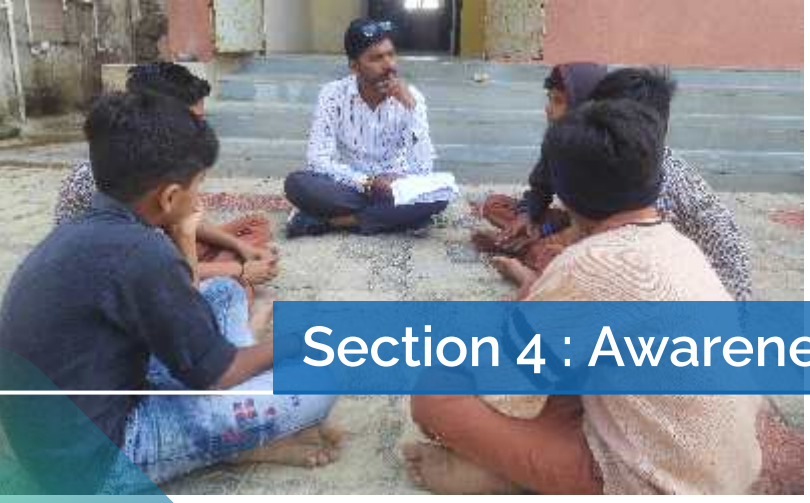
Project	Activity	Worked Well	Can Be Improved
Indigenous Flora Biodiversity Conservation	Maintenance of the Biodiversity park	The park has been maintained diligently for the last two decades, creating a haven for local flora and fauna.	
	Conservation of indigenous plants in their in-house nursery	The in-house nursery helps conserve the local flora and distributes the samplings across the nearby villages, thus helping to propagate indigenous flora that is beneficial to local biodiversity.	

Table 7: Outcome Achievement Matrix of Greening Projects

3.4 Recommendations

Indigenous Flora Biodiversity Conservation

1. Utilisation of the Gogul plant (Commiphora wightii): The study found that the Gogul plant could be utilized for its fragrance, making it suitable for products like incense sticks or perfume. This discovery opens opportunities for the community to explore alternative livelihood options while contributing to environmental sustainability.



Section 4 : Awareness and Training

4.1 Overview & Impact of Projects

4.1.1. ECO Clubs Program

The ECO Club project began in 2007 and aimed to increase awareness of biodiversity conservation, climate change, and sustainable practices among rural students, teachers, and communities in 42 villages of Okhamandal block in Devbhumi Dwarka district. By setting up 56 ECO clubs (cumulative) in schools and organizing various engaging activities, the project directly benefited over 6,000 students and educators (Figure 6).

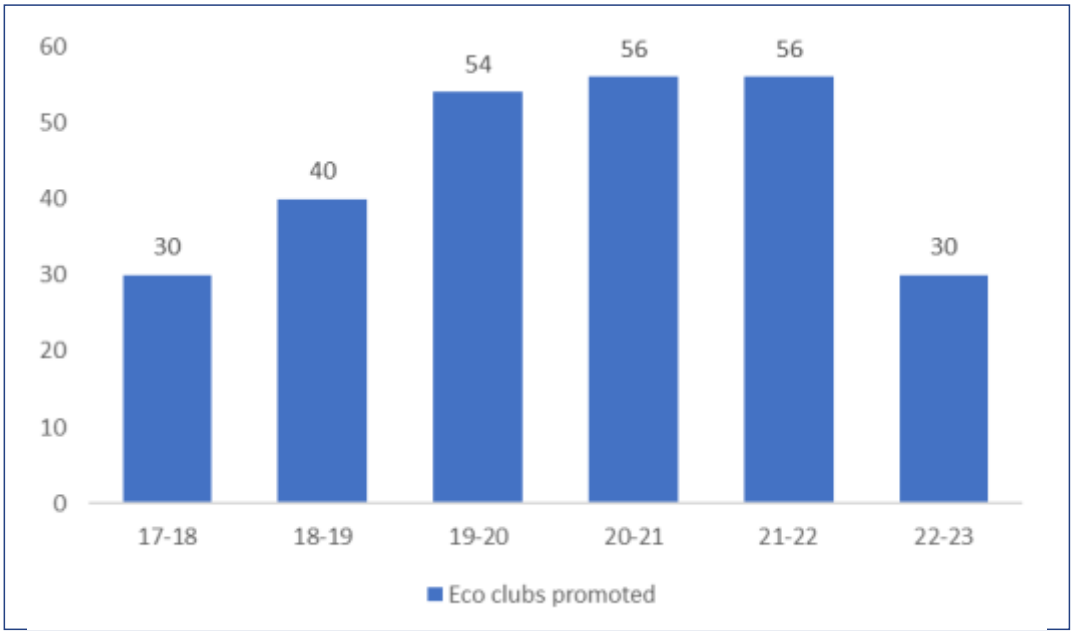


Figure 6: Total number of Eco clubs promoted from FY 2017 to FY 2023

The project organized workshops and exhibitions and received volunteer support to foster environmental stewardship among participants. It involved teachers and students from 25 high schools, aiming to tackle environmental issues and encourage eco-friendly practices. Activities such as workshops and initiatives like implementing plastic bans raised environmental awareness among students, leading to changes in behavior such as decreased plastic usage and increased involvement in environmental activities.

"The ECO club program has effectively created awareness among students about environmental issues. There's no waste plastic anywhere on our school grounds now." - Teachers from Aaranbhada village.

Teachers and students lauded the project for its positive influence on student behavior and the school environment, explicitly citing plant care and cleanliness improvements. The students explained how the activities through the Eco Club program have been both enlightening and empowering. Engaging in various tasks such as making organic compost from vegetable waste, establishing kitchen gardens, and participating in tree planting initiatives has provided them with valuable hands-on experiences in environmental stewardship. They also took pride in creating informative charts to raise awareness about preserving local wildlife.

Additionally, they shared their enthusiasm for spreading eco-conscious practices beyond the school grounds by planting trees in nearby villages and advocating for reduced plastic usage in daily life. Utilizing resources like thermocol sheets for their projects showcased their creativity while emphasizing the importance of sustainable materials. Their participation in these activities has deepened their understanding of environmental conservation and instilled a sense of responsibility toward creating a greener, healthier future.

"I planted trees in school and learned how to care for them. At first, I didn't know much about trees, but now I understand how they improve the environment. I've noticed that the air feels fresher when it rains, and I know it's because of the trees releasing oxygen. I've become passionate about the importance of trees, and I often share with my friends and family the benefits of planting more trees." - Student from Hamsur village.

The program's influence extended beyond the school environment, with students sharing their newfound knowledge with family and friends, garnering support and interest from the community. The teachers and students emphasized the importance of expanding the program's reach to include parents and villagers, suggesting that greater involvement would lead to more significant community-level impacts.

"To enhance efficiency, I believe involving school children and parents in the program would greatly benefit the community. When everyone is engaged, we can see the impact more quickly. Additionally, when organizing environmental exhibitions, they should be open to the public and scheduled on holidays to ensure maximum participation. This way, we can spread awareness and inspire more people to take action for our environment." - Teachers from Surahkaradi village.

While the program has been successful in many aspects, teachers and students have identified areas

for improvement. Suggestions include increasing community outreach, enhancing program visibility, and expanding the age range of participants to instill environmental awareness from a young age.

"In my opinion, I believe the project should be expanded to encompass students from 3rd to 8th grades. By including younger children, we can instill environmental awareness early, fostering a deeper understanding and appreciation for nature among students across various grade levels." - Teacher from Aaranbhada village.

The Eco Clubs project has effectively delivered environmental education and meaningful actions within schools and neighboring villages. With ongoing dedication and support, it has the potential to make lasting contributions to environmental conservation and community development. To further enhance the project's impact, the project can expand the eco clubs to include lower-grade students in teaching the correct practices early and increase community engagement by including parents of students as part of the learning workshops.

4.1.2. Prakruti Parivar Project

Launched in 2014, Pràkruti Parivar aimed to cultivate environmental awareness and active participation among Tata Chemicals' employees, their families, and retired staff. Over 500 volunteers formed the "Prakruti Parivar," organizing awareness sessions, eco-fairs, and tree-planting initiatives. Their activities extended to creating a biodiversity index of indigenous flora and fauna within their township, fostering knowledge-sharing and conservation efforts. Participants engaged both online and on the field, dedicating their time and efforts to environmental programs and making meaningful contributions to sustainability within their community. Between 2020-23, the project reached over 21,549 people through 481 awareness programs conducted with the help of Volunteers.

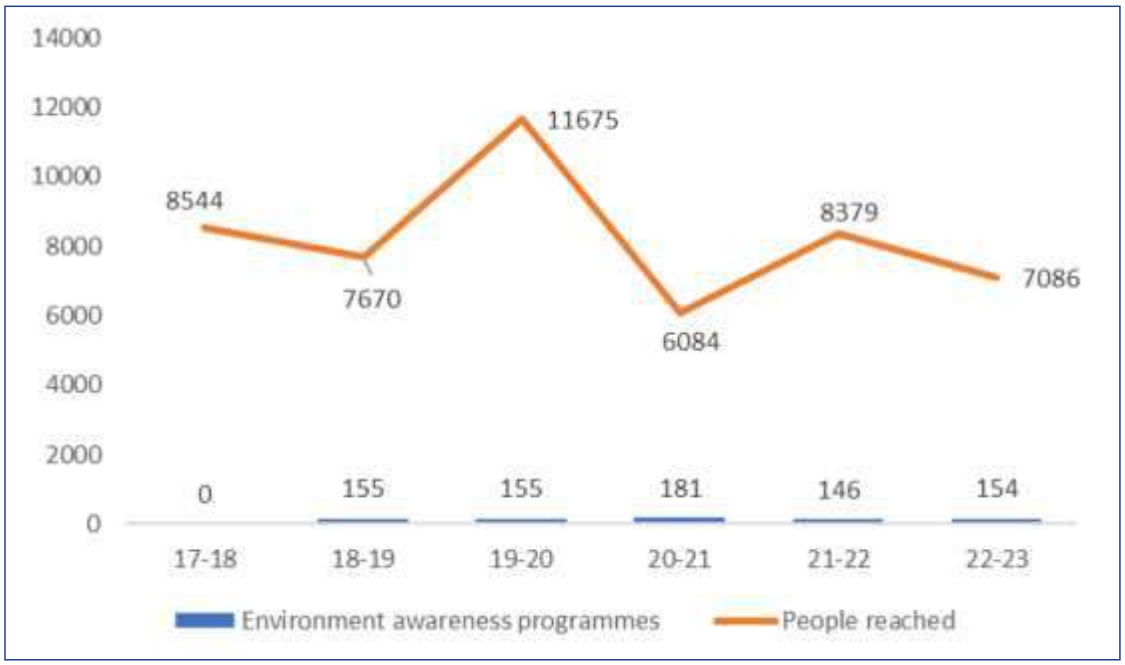


Figure 7: Total number of environment awareness programmes from FY 2017 to FY 2023

The Prakruti Parivar project was a platform for environmental conservation and community welfare. Through discussions with volunteers and stakeholders, it was evident that the project played a significant role in fostering environmental stewardship and community responsibility.

The project disseminated information through WhatsApp groups and coordinated various environmental activities. Volunteers, including TCL employees, ex-employees, and their family members, actively participated in initiatives like tree plantation drives, awareness programs, and cleanliness campaigns.

“Our Prakruti Parivar project operates continuously alongside several other environmental initiatives. For example, whenever we plan a tree plantation drive, we share the details within our WhatsApp group so interested volunteers can join. Our main goal with this project is to engage in conservation and preservation efforts actively. We strive to involve volunteers in every activity possible to ensure broad participation in our environmental protection endeavors.” - FGD with Prakruti Parivar Volunteers.

Volunteers took pride in their association with an organization supporting impactful initiatives. The project's effectiveness relied on efficiently utilizing resources, primarily human capital, with approximately 500 committed volunteers collectively contributing over 6185 volunteering hours[8] to propel its success. It ensured widespread engagement in environmental conservation by maximizing volunteer participation. To promote active involvement, the project recognized the volunteer with the highest number of volunteering hours.

While the project's operations were commendable, there were suggestions for further improvement, including incorporating technology for bird detection using vocal recognition and emphasizing recycling and reuse within the project scope. These enhancements could enhance the project's efficiency and impact, aligning it more closely with broader organizational objectives.

“The project should incorporate technology to improve efficient tracking of activities, and also to improve the recycling efforts” - - FGD with Prakruti Parivar Volunteers.

The sustainability of the Prakruti Parivar project appears promising, given the increasing participation and commitment among volunteers. With a growing support base and resources, the project is well-positioned to continue positively impacting the environment and community long term. Availing app-based technologies to track projects, activities, communication, and educational information may increase engagement and efficiency further.

4.1.3 Green School Programme

The Green School Programme, initiated in October 2018 and operational until March 2021, aimed to foster environmental awareness and education among students through awareness sessions and fieldwork conducted in schools. This collaborative effort was spearheaded by TCSRD in partnership with BVIEER (Bharati Vidyapeeth Institute of Environment Education and Research) at Bharati Vidyapeeth University, Pune. The program targeted participating schools' students, teachers, and principals, engaging them in various environmental conservation activities.

A total of 25 high schools within the Okhamandal block actively participated in the initiatives led by the TCSRD team. The program comprised five modules covering essential topics such as biodiversity, waste management, cleanliness, energy conservation, and water conservation. Awareness sessions were conducted twice a month in each school to deliver these modules, supplemented by outdoor field visits. Additionally, practical sessions were organized to enable students to participate in hands-on experiments, including laboratory activities like microscopic examination of leaves.

The schools were actively involved in environmental initiatives such as cleanliness drives and sparrow conservation projects, which included installing nest boxes. They also conducted activities focused on identifying local flora and fauna. The program facilitated continuous communication and information exchange among participants, including establishing WhatsApp groups and sharing multimedia posts. These communication channels proved especially vital during physical restrictions imposed by the COVID-19 pandemic, ensuring the continuity of the program's objectives while commemorating significant environmental events.

The study could not interview the project's beneficiaries because the project concluded in March 2021. Additionally, it couldn't independently verify the impact on the ground due to the unavailability of documentation.

4.2 Analysis

Parameters	Description
Relevance	• Environmental education plays a crucial role today, especially in regions like Okhamandal, where the proximity to the sea and the rich biodiversity accentuate the need for heightened awareness. Given the sensitivity of the area and the diverse range of flora and fauna it hosts, environmental education becomes even more vital to address issues like climate change and the responsible utilization of resources.
Effectiveness	• The project primarily aimed to raise awareness among schools and employees, extending this awareness to local villages and communities through field visits, workshops, and

	hands-on activities for students. This approach effectively achieved the project's goal of promoting environmental education and encouraging communities to take action through activities like cleanliness drives, tree plantations, and reducing plastic usage. Also, the project effectively delivered awareness sessions on five critical aspects of sustainability to 25 schools across Okhamandal block.
Efficiency	• With a budget of only 13.77 lakh rupees over the three years, the project successfully involved over 6000 students across 56 Eco clubs and engaged more than 500 volunteers in raising awareness and executing various environmental projects. Through the Eco Clubs and Prakruti Parivar initiatives, the project reached more than 20,000 people within the assessment period, effectively utilizing the available human and financial resources to benefit the local communities on time. Along with it, the awareness and engagement activities within the schools were managed with little to no expense due to collaboration with the schools and involving the stakeholders in disseminating the sessions.
Coherence	• The project fostered collaboration among schools, employees, their families, and the broader community to raise awareness, participate in environmental activities, and enhance the local environment for the villages and surrounding areas of the schools. These activities seamlessly integrated with the students' academic curriculum and provided meaningful engagement opportunities for employees beyond their regular office duties. • The Green School Program, with its collaboration with the local schools, addressed the need for awareness and environmental education among schoolchildren, addressing a critical gap in current education to live a sustainable life.
Impact	• The project's impact was evident in the shift in children's attitudes, transitioning from using plastic tiffin boxes to caring for local plants. Hands-on activities like making compost and creating kitchen gardens sparked students' interest in resource conservation, leading them to advocate for change within their families. Furthermore, employee engagement through volunteering bolstered confidence and trust among employees and their families in the organization. • Teachers, Students, and Other stakeholders of 25 schools benefitted from the awareness and hands-on fieldwork session that contributed to their knowledge of effective utilization and conservation of critical resources and nature.

Sustainability	• The involvement of Schools, and Employees have created a platfom for sustainability for the awareness and training activities for the social good and promoting correct behaviors among the society, the projects longevity is secured. However, the project can benefit improving the reacch among the lower grade students and families of the students to take part in the awareness and project implementations. • The Green School Program ended in 2020-21, and the study couldn't verify the sustainability of the project at the time of assessment.

Table 6: Analysis across REECIS parameters

4.3 Practices Worked Well & Not Working Well

Project	Activity	Worked Well	Can Be Improved
Eco Clubs Programme	Conducting Awareness sessions in school	Sessions helped in enhancing students' understanding of the environment and biodiversity conservation.	The COVID-19 pandemic has caused a slowdown in activities, leading to some schools in the area being left out of the Eco Clubs program. It's essential to include these schools in the program so that environmental initiatives can resume and continue within all the schools.
	Maintaining biodiversity register in school	Schools prepare a biodiversity register with the support of TCSRD containing information about the local birds, animals, and plants found in the area.	
	Conducting sightseeing of birds and trekking	This sightseeing activity aids students in identifying local bird species, animals, and migratory birds.	

	Conducting Ecofair in the schools	Students display their creativity through environmental-themed posters and models, showcasing their awareness and dedication to the environment.	
	Preparation of Manure and help in the Kitchen Garden	The practical exposure of creating manure and kitchen gardens empowers students to disseminate this knowledge within their communities, promoting sustainable practices at the grassroots level.	
Prakruti Parivar	Engagement of Volunteers	Engaging employees and their families in environmental projects improves the overall outlook toward the company culture and encourages employees to become brand ambassadors.	
Green School Programme	Collaboration with schools	Activities such as microscopic examination of leaves in the laboratory help to cultivate interest and engagement among students, and these awareness sessions are necessary to provide environmental education for the children.	

Table 7 : Outcome Achievement Matrix of Awareness and Training Projects

4.4 Recommendations

Eco-Clubs

1. Utilisation of Green School Programme Models: The model of this program can be effectively applied to the Eco Clubs initiative carried out by TCSRD in schools. The five models, which concentrate on water conservation, energy conservation, rainwater harvesting, waste management, and biodiversity conservation, can be embraced by Eco Clubs and implemented within schools. This strategy empowers students to actively participate in environmental projects and advocate for sustainable practices within their school communities.

2. Involvement of teachers and principals in planning: To ensure the effectiveness of ECO Clubs activities and align expectations between schools and TCSRD, it's crucial to engage teachers and principals more in planning these initiatives. Their involvement and collaboration can help customize the activities to address the specific needs and objectives of both the school and TCSRD, resulting in more successful outcomes in environmental awareness endeavors.

5. Conclusion

Tata Chemicals Limited's CSR initiatives, in collaboration with TCSRD, and other NGOs have substantially impacted villages and the coastal area in the Okhamandal block of Devbhumi Dwarka district in Gujarat. An outcomes assessment study, conducted for projects spanning fiscal years 2020-21 to 2022-23, meticulously examined the outcomes and impacts of initiatives implemented under the larger theme of Enablers for Sustainable Development.

The interventions were further categorized into three main areas: C-SCAPES, which aimed to enhance coral reef coverage, protect whale sharks, and establish mangrove plantations to enhance marine ecology; Greening Projects, which focused on restoring and conserving indigenous flora and fauna, along with providing environmental education to schoolchildren covering topics such as biodiversity, waste management, cleanliness, energy, and water conservation; and Awareness and Training, which aimed to raise awareness about biodiversity, climate change, and sustainable practices among rural students, as well as engage employees and their families in impactful activities.

The interventions have effectively met their objectives, significantly impacting the implementation areas. Under the C-SCAPE initiatives, efforts focused on environmental conservation, involving 10,000 fishermen and 25,000 school children in raising awareness about whale sharks. Additionally, 125,000 mangroves were planted across 50 acres, while coral reef coverage expanded by 1701 square meters. These efforts resulted in a tenfold increase in fish availability, the discovery of nine new fish and five seahorse varieties, the rescue of 115 whale sharks, and more sightings of whale sharks. Moreover, they mitigated land erosion, improved marine life, and provided additional local livelihoods. Meanwhile, the Greening Projects restored indigenous flora and fauna across a 170-acre reserve area, benefiting new bird and reptile species. Community involvement was facilitated through an in-house nursery promoting the plantation of indigenous flora. The Awareness and Training program instilled positive behavioral changes among children and community members, while also engaging employees and their families through volunteering.

To improve project outcomes, engaging young fishermen in awareness, outreach, and project implementation is essential to foster community ownership of initiatives such as coral reef restoration,

mangrove plantation, and whale shark rescues. Additionally, gaining policy-level support from the government, along with adequate funding and human resources, would greatly benefit these projects. In the biodiversity program, efforts should be directed towards identifying methods to eliminate or reduce the invasion of invasive floral species. Furthermore, enhancing outreach and including lower-grade students in Eco Clubs, as well as involving parents in environmental workshops, would enhance the effectiveness of awareness and training projects.

The collaborative thematic intervention, "Ensuring Environment Integrity," spearheaded by Tata Chemicals in partnership with implementation partners, has been instrumental in revitalizing the marine life and biodiversity of the Okhamandal block while also providing sustainable livelihoods to local fishing communities. Furthermore, the awareness and training activities have led to a significant shift in attitudes and perspectives towards nature. The impact assessment study reaffirms the success of these initiatives and provides valuable insights for future improvements, ensuring that CSR endeavors maintain their meaningful and enduring impact on the communities they support.

Enablers for Sustainable Development

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LIST OF ACRONYMS

AIF	American India Foundation
AKRSP	Aga Khan Rural Support Programme
ANC	AnteNatal Care
CSPC	Coastal Salinity Prevention Cell
ECCE	Early Childhood Care & Education
FCCH	Facilitation & Care of Community Health
FGDs	Focus Group Discussions
GDP	Gross Domestic Product
ICDS	Integrated Child Development Services
IEC	Information, Education & Communication
IMR	Infant Mortality Rate
ITI	Industrial Training Institue
KIIs	Key Informant Interviews
KPI	Key Performance Indicators
LAMP	Learning And Migration Programme
LEP	Learning Enhancement Programme
LOLT	Light of Life Trust
LRC	Learning Resource Centres
MMR	Maternal Mortality Rate
NMR	Newnatal Mortality Rate
NSDM	National Skill Development Mission
ODF	Open Defecation Free
OPD	Outpatient Department
PNC	Postnatal Care
PRIs	Panchayati Raj Institutions

PWD	Persons With Disabilities
RO	Reverse Osmosis
RRHWS	Roof Rainwater Harvesting Water Structure
RTE	Right To Education
SMC	School Management Committee
SSKK	Shikshan ane Samaj Kalyan Kendra
STEM	Science, Technology, Engineering, and Mathematics
TCL	Tata Chemicals Limited
TCSRD	Tata Chemicals Society for Rural Development
VLC	Village Learning Centres
WASMO	Water And Sanitation Management Organization
WOW	World On Wheels
YDSC	Youth Development Scorecard
YEP	Youth Employment Programme

INTRODUCTION

Enablers for Sustainable Development

Facilitating sustainable development through targeted interventions is paramount for driving enduring societal transformation. To achieve this, addressing multifaceted challenges in critical sectors like health, education,skill development and access to clean drinking water and sanitation is essential. Investment in health initiatives ensures the workforce's vitality and empowers individuals and communities through education. Moreover, access to clean water and sanitation forms the bedrock of public health and environmental sustainability. As India grapples with a rapidly growing population and diverse socioeconomic landscapes, it stands at a pivotal juncture in its developmental trajectory, navigating a complex web of interrelated issues impacting the well-being of its populace.

Over the past two decades, India has witnessed remarkable advancements in its healthcare landscape, with notable improvements in life expectancy and reductions in infant, maternal, and under-five mortality rates. Life expectancy at birth has steadily increased from 62 years in 2000 to 70.8 years in 2019[9], accompanied by a significant decline in infant mortality rates, which dropped to 27 per 1,000 live births by 2020—almost 2.5 times lower than in 2000. Furthermore, the neonatal mortality rate (NMR) and under-five mortality rate (U5MR) have substantially decreased, plummeting by over half and nearly 75 percent between 1990 and 2020[10]. Despite these achievements, challenges persist, particularly regarding the quality of maternal health service, where India grapples with the burden of having the highest number of stillbirths globally, along with preventable maternal deaths affecting approximately 35,000 women annually[11].

Access to reproductive health services remains limited, especially among marginalized communities and rural populations, exacerbating existing disparities in healthcare access. Additionally, India faces a dual burden of communicable and non-communicable diseases, with diseases like tuberculosis, malaria, and diarrheal illnesses persisting alongside emerging threats such as dengue and chikungunya. The government's healthcare expenditure, hovering around 1% of GDP over the past decade, underscores the urgent need for increased investment in the healthcare sector.[12]

[9]https://data.who.int/countries/356#:~:text=expect%20to%20live-,In%20India%2C%20life%20expectancy%20at%20birth%20(years)%20has%20improved,to%2070.8%20years%20in%202019.

[10]https://www.unicef.org/media/79371/file/UN-IGME-child-mortality-report-2020.pdf.pdf

[11]https://rchiips.org/nfhs/nfhs4.shtml

[12]https://india.un.org/en/171844-health-water-and sanitation#:~:text=India%20has%20made%20rapid%20progress,provided%20with%20piped%20water%20access.

In education, India has made significant strides in improving access to high-quality education. This progress is evident in the rising enrollment rates in elementary schools and the declining number of children not attending school. Key legislative measures like the Right of Children to Free and Compulsory Education (RTE) Act (2009) and policies such as the National Early Childhood Care and Education (ECCE) Policy (2013), along with national education policies, have played crucial roles in driving this progress.

However, according to surveys conducted in 2009 and 2014, the number of children not attending school decreased significantly from 13.46 million in 2006 to an estimated 6.1 million in 2014[13]. Despite this improvement, dropout rates before elementary education remain alarmingly high, Moreover, approximately half of adolescents fail to complete secondary education, and around 20 million children lack access to preschool education.th 29% of girls and boys leaving school prematurely[14]. Concerns also arise regarding learning outcomes, with nearly half of primary school children failing to reach grade-appropriate learning levels, as evidenced by the National Achievement Survey (NCERT 2017). Additionally, the readiness of children for school at age five falls below expected standards, indicating further challenges in the education system. Furthermore, the educational landscape has experienced significant setbacks in student learning outcomes due to the school closures that occurred due to the COVID-19 pandemic, impacting education services across India.[15]

Along with education, skill development also remains a critical focus amid efforts to bridge the gap between education and employment. With a burgeoning youth population and increasing automation, there's a pressing need to equip individuals with relevant skills to meet the demands of a rapidly evolving job market. While initiatives like Skill India aim to address this challenge by providing vocational training and certification programs, there are persistent issues such as outdated curricula, inadequate infrastructure, and limited industry partnerships hindering progress. Additionally, disparities in access to education and training opportunities further exacerbate the skills gap, particularly in rural and marginalized communities.
Regarding drinking water and sanitation, as per the Unicef Report on Education, India has made remarkable strides in addressing drinking water and sanitation challenges, particularly in rural areas, with 43.5 million rural households gaining access to piped water as of June 2021. The focus has shifted from merely constructing toilets to ensuring their utilization and sustainable waste management practices. Efforts have extended to urban areas through SBM-Urban, emphasizing the entire waste management supply chain.

However, other challenges remain, especially concerning water quality. Around 37.7 million Indians suffer from waterborne diseases annually, highlighting the urgent need for improved water quality monitoring and treatment. Additionally, India faces water scarcity issues, with over 80% of domestic water supplied by groundwater, leading to declining water levels and water stress in numerous districts and blocks. Wastewater treatment remains inadequate, contributing to water pollution, as only 31% of industrial and domestic sewage receives treatment, posing environmental and health risks[16]. Addressing these challenges requires concerted efforts in water resource management, quality monitoring, and wastewater treatment to ensure sustainable access to safe drinking water and sanitation for all.

centric approach highlights TCL's commitment to sustainable development and its aspiration to make a tangible impact on the lives of those it serves.

[13]SRI-IMRB Surveys, 2009 and 2014
[14]Rapid Survey of Children 2013-2014 MWCD
[15]https://www.unicef.org/india/what-we-do/education
[16]https://india.un.org/en/171844-health-water-and-sanitation

This report assesses the factors contributing to sustainable development, focusing on projects spanning the themes of Health, Education, Drinking Water, and Sanitation.

Project Introduction

TCL is committed to sustainable development through its CSR initiatives. They believe that social, economic, and environmental progress is vital in driving meaningful change. TCL recognizes that prioritizing health, wellness, and education is essential for sustainable advancement. These pillars are critical drivers for the success and durability of their developmental efforts.

Detailed below are the specific interventions that TCL undertook within the assessment period within the Enablers for Sustainable Development framework.

Themes	Interventions
Health	**Mobile Health Clinic** • In collaboration with TCL Mithapur Hospital, a mobile health van was deployed to visit villages every month. It offered outpatient department (OPD) services, conducted screenings, and organized health camps.
Education	**Continuity of Education** • Scholarship Programme - TCSRD provided a range of scholarships to assist students from underserved communities in pursuing higher education. **Quality of Education** • Learning and Migration Programme (LAMP) - In collaboration with the American India Foundation, the program focused on providing academic support, establishing learning centers, and implementing language development interventions for salt mine worker communities. • Learning and Enhancement Programme (LEP) - Learning centers were constructed in remote villages to address challenges related to distance and transportation. These centers provided tutoring, coaching, and support to facilitate mainstream integration. • World on Wheels (WOW) Bus - The mobile bus visited schools equipped with facilities to promote computer education and offered special science classes.

	• Quality Education Enhancement Program by CSPC (Coastal Salinity Prevention Cell) - CSPC implemented an educational quality-based program, which included initiatives such as setting up libraries, conducting teacher training sessions, and strengthening School Management Committees (SMCs). • Village Learning Centres (VLC) - Community centers were constructed in villages, providing academic support through tutors and facilitating mainstreaming.
Skill Development	• Technical Training Institute in Mithapur provides training on industry trades and generates a quality workforce for different sectors. • Tata Strive in Aligarh: The Tata Strive Skill Development Centre in Aligarh offers underprivileged youth a comprehensive learning experience, providing them with employable skills to improve their career prospects and secure employment. • Youth Employment Programme (YEP) in Mambattu and Cuddalore: TCSRD partnered with the TCS Youth Employment Programme (YEP) to launch a skill development initiative in Mambattu and Cuddalore to promote inclusive growth. This program targets marginalized youth, equipping them with the skills needed to enhance their employability.
Drinking water & Sanitation	• Roof Rainwater Harvesting System (RRWHS) TCSRD implemented the RRWHS program for the community, enabling them to collect and utilize rainwater effectively. • Swachh Tarang The Swach Tarang initiative, conducted by TCSRD in collaboration with Ncourage, addressed the challenges faced by underprivileged communities in India regarding clean drinking water. • WASMO WASMO (Water and Sanitation Management Organization) and TCSRD collaborated to provide clean drinking water to villages in Okhamandal taluka.

Sampling

A convenient sampling method was used to identify the participants for the study. The sample population for each intervention is given below.

Location	Subtheme	Intervention	Methodology	Key Informant Interviews	Focus group discussions
Okhamandal - GJ	Holistic Nutrition programme	Mobile Health Clinic for FCCH	Qualitative Assessment with on-Field Visits	Sarpanch (2) Referral Services Doctors (1) Taluka health officer (1) Asha Worker/AWW/ANM (2) Mobiliser (1) Mobile Health Clinic Team (1- Doctor) TCSRD TEAM (1)	Beneficiaries (3)
Okhamandal	Continuity of Education	Assessment of 4 scholarships program	Qualitative Assessment conducted virtually	Beneficiaries (7) Parents (1) School teacher (1)	
Kutch	Quality of Education	Learning and Migration Programme (LAMP)	Qualitative Assessment conducted in combination with physical and virtual	American India foundation KII -1	
Okhamandal		Learning and Enhancement Programme (LEP)		Teachers (2) Tutor (2)	
Mithapur - GJ		World on Wheels (WOW) Bus	Qualitative Assessment with on-Field Visits	Teacher (3) Trainer (1) Education Officer (1)	Student 5)
Mithapur, GJ		Quality Education Enhancement Program by CSPC (Coastal Salinity Prevention Cell) Village Learning Centres - learning centres in the community	Qualitative Assessment with on-Field Visits Qualitative Assessment conducted virtually	Teacher (3) CSPC Team-1 Key informant interviews: Mambattu Teachers KII (5)	Student (2)

Villages around Cuddalore - TN Mambattu - AP		hall/panchayat hall) Mambattu approx 1000 students Cuddalore approx 2000 students		Students (2) Project Team (1) Cuddalore Teacher KII (4) Student (2)	
Mithapur - GJ		SAKSHAM Programme (9284 youths trained)	Mixed-Method Approach, On-Field Visits	Trainers (3) Youth KII (15)	Youth FGD (1)
Aligarh - UP		TATA STRIVE (Youths enrolled 2984)	Mixed-Method Approach, On-Field Visits	Trainers (3) Employers (4) Mobilisers (2) Placement coordinator (1) Youths-(15) Parents-(5)	
	Mambattu	Skill Development (274 youths enrolled)		Key Informant Interviews: Mobilisers (2) Youths: (15) Parents: (2)	
	Cuddalore - TN	TCS- Youth Employment Programme (YEP) (250 youths enrolled)		Key Informant Interviews: Trainers (1) Youths: (7)	

Okhamandal-GJ	Water Storage and Conservation	Roof Rainwater Harvesting System (Mithapur) Houses covered - 636	Qualitative Assessment with on-Field Visits	Sarpanch (5) RRHWS (6) Project team-1	FGD-3
Okhamandal-GJ	Water Storage and Conservation	2. Swach Tarang - 1000+ installations across the country	Qualitative Assessment conducted virtually	TCSRD (1)	Focus Group Discussions: Community (3)
Okhamandal - GJ	Sanitation	Tap water connection support collaboration with WASMO	Qualitative Assessment	Sarpanch (2)	Community (1) Pani Samiti (1)

Table 1: Primary Research Sampling

Section 1 : Health

In the health domain, TCSRD focused on reducing the Infant Mortality Rate (IMR) and Maternal Mortality Rate (MMR) through diverse programs aimed at improving nutrition and providing education on nutrition-related topics. Moreover, the organization actively promoted general healthcare services and education, particularly regarding access to safe drinking water and sanitation. Additionally as part of its efforts to enhance healthcare accessibility in remote areas, TCSRD introduced mobile medical vans.

1.1. Mobile Medical Van

1.1.1 Program Overview

The mobile health van program initiated by TCSRD in 2019 addressed health accessibility challenges, such as lack of transportation and distance to facilities, in the Okhamandal region. Initially, the program covered 22 villages, but with the introduction of a second health van in 2023, it expanded to include 44 villages in the targeted area. During the assessment period, the van covered 22 villages with an approximate 50000 population. The services offered by the van include outpatient services, medical camps, antenatal care/postnatal care (ANC/PNC), screening, and referrals. Collaboration with ICDS ensures the effective implementation of these services.

1.1.2. Findings & Analysis

The introduction of the mobile medical van aimed to offer a basic outpatient department (OPD) facility directly to the community as part of TCSRD's Facilitation & Care of Community Health (FCCH) initiative. This program, a collaboration between TCL Mithapur Hospital and TCSRD, had the following objectives:

- To cover the 50,000 population of 22 villages of the TCL plant operation area.
- To register and to provide primary treatment to the 10000 patients
- Strengthen linkages with health and ICDS to improve their services
- Aware community of various Health/ICDS facilities/government welfare schemes.

Monthly review meetings were conducted with heads of both functions. TCSRD was responsible for the preparation and sharing of KPI-based monthly reports.

The medical van team consisted of a doctor, coordinator, nurse, two volunteers, and a driver. TCSRD's responsibilities included providing a doctor and nurse for 4-5 hours (9 am to 2 pm), a project coordinator for village-level community management during camps/events, and handling reporting & documentation. TCL Mithapur Hospital was responsible for providing a gynaecologist/paediatrician for a day each month for health talks, supplying a mobile van with

running expenditure, medicines for OPD, and free treatment for referral cases from village OPDs at TCL facilities. They also provided specialist doctors for cluster-level special OPD.

The mobile health van visited the village twice a month, conducting health screenings, distributing medication, offering counseling, and addressing minor ailments. It operated locally, stationed within the village for three hours, providing a convenient opportunity for individuals to consult with a doctor and receive primary treatment. This significantly eased the burden on villagers, who previously had to travel long distances for medical attention. Due to their remote location and limited local transportation options, the villages faced significant challenges in accessing proper healthcare.

"The Mobile Health Van has significantly streamlined access to medications for the community, prompting eager anticipation for its visits. Villagers eagerly await the van's arrival so they can conveniently obtain their prescribed medicines." - FGD with beneficiaries, Makanpur village.

The ICDS Department was closely involved in the process, with Anganwadi workers providing strong support in implementation. ICDS and TCSRD jointly conducted mobilization and awareness generation efforts. In collaboration with the Anganwadi workers, the medical van played a vital role in monitoring the haemoglobin levels of young girls in the village to detect anaemia. Utilizing the assistance of the Anganwadi and school administrations, they identified and prepared a list of young girls, including both dropouts and those attending school, for haemoglobin checks. Upon assessment, if any girl's haemoglobin levels were found to be low, they initiated treatment by providing medications, syrup, and nutritional guidance. Progress was closely monitored every month, with continuous support and follow-up provided to these girls.

Anganwadi workers also assisted TCSRD in tracking and managing health initiatives effectively. They disseminated information about mobile health services, going door-to-door to inform and assist villagers. Additionally, special programs like Mamata Diwas (Mother's Day) were organized, where the mobile health van doctor educated villagers on health maintenance and provided crucial support.

"There has been a lot of difference compared to before. In the village, people are getting treatment for small and big diseases. There is no need to go outside the village. After the arrival of the mobile van, everyone is getting treatment." - KII with Anganwadi Worker.

The mobile medical team's flexibility and adaptability ensured effective service delivery, even during crises like the COVID-19 pandemic, where they distributed essential supplies, conducted awareness campaigns, and facilitated vaccination drives.

"The mobile health team receives positive feedback from the communities from time to time about the services they provide. They are happy that such health medical services are provided at their doorsteps to mitigate their health medicine challenges." - KII with Medical van team.

The community has expressed satisfaction with the services offered by the mobile health vans, highlighting the newfound accessibility to essential healthcare services that were previously unavailable in their village. Villagers appreciate TCSRD's initiative in addressing the healthcare needs of remote villages. The introduction of mobile healthcare services has notably improved healthcare accessibility and outcomes in the village, narrowing the gap in healthcare provision and empowering the community to lead healthier lives.

"We are happy and satisfied with the services. We take the medicines and syrup as suggested by doctors." - FGD with beneficiaries, Lalsingpur village.

Asha workers suggested increasing the frequency of medical van visits to weekly instead of biweekly and establishing a fixed schedule to allow villagers to plan accordingly and make themselves available. Other than that, the project had no other suggestions or negative remarks from any stakeholders interviewed, signifying the complete acceptance and usage of the project.

"I believe the mobile health van should come once a week to support those who require glucose bottles. Maintaining a consistent schedule for the mobile clinic's visits to our community is important. This way, residents can anticipate their healthcare needs and plan accordingly." - KII with Asha worker, Makanpura village.

1.2 Analysis

Themes	Analysis
Relevance	• Mobile health clinics are essential in the rural villages of Okhamandal, Gujarat, where access to healthcare is limited due to inadequate infrastructure and geographical remoteness. These mobile units bring medical services directly to residents, addressing challenges related to transportation and distance. Providing on-the-spot consultations, screenings, and treatments ensures timely access to healthcare, especially for those with mobility or financial constraints. Additionally, mobile clinics play a vital role in preventive healthcare and health education initiatives, promoting awareness and healthy lifestyles. Overall, they are crucial for improving healthcare accessibility, addressing medical emergencies, and enhancing the well-being of rural communities in Okhamandal.
Effectiveness	• The project successfully achieved its objective of establishing basic healthcare facilities for rural communities in the Okhamandal block. These communities were previously isolated from healthcare services due to geographical distance and the absence of proper healthcare infrastructure. The beneficiaries expressed full satisfaction with the healthcare facilities provided in the intervening villages.

Efficiency	• Over the course of three years, the project incurred an expenditure of 235 lakh Indian rupees on mobile van infrastructure, health awareness sessions, distribution of essential supplies, and vaccination drives. These efforts benefited over 22 villages and more than 22 thousand beneficiaries annually. The project efficiently utilized specialists from Mithapur Hospital to conduct awareness sessions, while Anganwadi and Asha workers facilitated mobilization and service dissemination. Overall, the project effectively managed human, financial, and time resources.
Coherence	• The project partnered with the local hospital to conduct awareness sessions and provide medical services for referred patients requiring hospital admission. It effectively integrated with existing healthcare resources in the villages, including Asha and Anganwadi workers, to mobilize villagers and raise awareness. By filling gaps in the existing healthcare system and enhancing its capacity, the project avoided creating a parallel system and strengthened overall healthcare access for 22 villages till 2023, and expanded to 44 villages thereafter with an introduction of additional mobile vans.
Impact	• Mobile vans have expanded access to primary healthcare for over 50,000 residents across 22 villages over a span of three years, maintaining biweekly availability. These vans not only provided medical services but also raised awareness about maternal health and nutrition. Patients requiring hospital admission were referred to Mithapur hospital. The project leveraged existing healthcare infrastructure in the villages, enhancing accessibility by bringing services directly to people's doorsteps. As a result, villagers embraced regular checkups, leading to healthier lifestyles and a reduction in the tendency to overlook early symptoms, a common issue in rural India.
Sustainability	• The project effectively utilized existing facilities and addressed gaps by enhancing both community capacity and infrastructure through awareness sessions and deployment of mobile vans. The impacts were substantial and enduring. To further reduce reliance on Mithapur TCL Hospital, the project could be enhanced by adding additional diagnostic and on-site testing capabilities.

Table 2: Analysis across REECIS parameters

1.3 Practices Worked Well & Not Working Well

Project	Activity/Practices	Worked well	Can be improved
Health	Mobilization of the community	Volunteers were crucial in mobilizing and disseminating information about the Mobile Health Van to the community.	
	Providing consultation and medicines	The Mobile Health Van program provided medical services effectively, enabling the community to access free consultations, medications, and healthcare services.	
	Awareness of nutrition and wellness	The counseling provided by the doctor of the Mobile Health Van assisted the community in gaining awareness and information on nutrition, diet, and overall wellness.	
	Screening of the Anaemic girls and women	In collaboration with Anganwadi centers and schools, the TCSRD team conducted screenings to effectively identify anaemic girls and address this issue in the area.	
	Analysis of the activities/visit of the Mobile Health Van	The TCSRD team conducted analyses of their services (consultations, screenings, camps, etc.) and visited target villages to assess the health status of the communities. This enabled them to strategically plan their	Their schedule for visiting villages should be reviewed to provide consistent services weekly.

		interventions, focusing on villages that required additional attention and support.	
	Collaboration with the ICDS	Doorstep services were facilitated through the collaboration of Anganwadi and ASHA workers, who also assisted in the mobilization and screening process.	

Table 3: Output Achievement Matrix of Health Project

1.4 Recommendations

1. Improvement of facilities in Mobile health van: To improve the mobile health van program in Mithapur, adding extra diagnostic tools to the van would greatly enhance its effectiveness. On-site testing capabilities enable faster diagnoses and more efficient treatment plans for patients. Additionally, addressing the current lack of ventilation within the van is crucial. Especially during the summer months, poor air circulation can create discomfort for both patients and healthcare providers. Installing proper ventilation systems, such as robust exhaust fans, would significantly enhance the overall experience for all involved. Along with that increasing the frequency of visits from biweekly to weekly as well as fixing the schedule is recommended considering the community feedback.

2. Strengthening of Anganwadi centers: TCSRD partnered with ICDS to offer medical care services to the community. There's a need to boost the capacity of Anganwadi centers, which could serve as consultation spots for the community. Strengthening these centers would enable them to better provide vital healthcare services. This entails investing in capacity building to empower Anganwadi workers with essential skills and resources. By supporting this initiative, TCSRD can play a larger role in meeting the healthcare needs of the community and promoting overall well-being.

3. Digitalisation of documentation: The Mobile Health Van team is encountering difficulties in documenting patient information across various stages, such as registration and maintaining patient records. Adopting digital documentation would greatly alleviate these challenges by streamlining the process, saving time, and enabling more effective tracking of patient progress. Digital records would enhance efficiency, minimize paperwork, and simplify access to patient information, thereby enhancing the quality of healthcare services provided by the Mobile Health Van team.

Section 2 : Education

Education projects of TCSRD are further divided into the sub themes of continuity & quality of education.

2.1. Continuity of Education

By prioritising interventions to support educational continuity, TCSRD ensures everyone has equal opportunities and contributes to developing a diverse and skilled workforce capable of advancing society and tackling global challenges. Within its education continuity program, TCSRD runs various projects, including scholarship programs and digital education initiatives, which are essential components of its educational efforts.

2.1.1. Scholarship Program

Scholarships play a crucial role in breaking down financial barriers that often hinder access to education for marginalized communities. By offering financial assistance, scholarships enable individuals to pursue higher education and empower them to attain their full potential. Moreover, targeted scholarship programs can address specific educational needs, such as STEM fields or underrepresented demographics, thereby promoting diversity and innovation in various fields.

Recognizing students' challenges in the salt mine region, including high dropout rates due to financial constraints and seasonal migration, TCSRD introduced several scholarships to support children's education across various levels, mainly focusing on Affirmative Action communities. These scholarships were implemented in response to critical community needs. The region's high student dropout rates and widespread poverty created educational barriers exacerbated by disruptions caused by seasonal migration.

These challenges underscored the need for targeted interventions to ensure educational continuity in the form of tailored scholarship initiatives as below:

- **Desh ko Arpan**:
  - Started in 2003-04 for the salt mine worker community
  - Classes - Merit based, For 8-9 grades and 10-12th grades
  - TCSRD Entrance exam is conducted (80% for school exam results and 20% for entrance exam results)
  - Eligibility criteria - Should be from TCL-Mithapur location and parents/ guardians to be TCL employees and residents of Devbhoomi dwarka district
  - Priority for girls, AA community, and other socially vulnerable communities or individuals

- **Higher Education**:
  - Started in 2018-19 for all communities for higher education for those who scored more than 50% in 12th grade
  - Courses -medical, technical degree, technical diploma, nursing, others
  - TCSRD Entrance exam is conducted (80% for school exam results and 20% for entrance exam results)

- **Shri Darbari Seth**:
  - Started in 2021-22 and named after the previous visionary chairman
  - Courses- BE/BTech Chemical Engineering students, BSc/MSc Chemistry Parents/ guardians to be TCL employees and residents of Okhamondal

- **Affirmative Action:** Scholarship specifically focused on marginalised communities (SC,ST and PWD)

Their scholarship criteria changes every year according to the budget availability.

Apart from the four scholarships highlighted earlier, TCSRD also have Buddy4Study program, a platform assisting students in finding scholarships, to broaden their outreach. Additionally, they offered special scholarships for students impacted by COVID-19 from single-parent households, alongside other available scholarships. These scholarships aimed to provide financial support for study materials, tuition, and travel expenses.

A total of 1567 scholarships were distributed in the 3 years across the various scholarship initiatives, amounting to 49.84 lakh Indian rupees.

Figure 1: Total number of students received scholarship from FY 2020 to FY 2023

The data revealed a consistent trend of the number of student scholarships awarded falling short of the established targets over the three-year period. In 2020-21, there was a substantial gap between the target (1080 scholarships) and the actual achievement (789 scholarships), indicating potential challenges in meeting the initial goal. This trend persisted in 2021-22 and 2022-23, with targets of 800 and 200 scholarships, respectively, yet actual achievements of 613 and 165 scholarships. The decreasing targets over

the years may reflect adjustments made in response to past performance or allocation to other education projects.

The assessment study interacted with seven beneficiaries from Bhimrana village who received either the Desh Ko Arpan, Higher Education, or Shri Darbari Seth scholarships and belonged to low-income earning families earning below 2 lakh rupees annually as part of the outcomes assessment and unearthed the insights below.

TCSRD's scholarship project has been instrumental in addressing critical educational challenges faced by students in communities like Bhimrana Village. These challenges include high dropout rates due to financial constraints and disruptions caused by seasonal migration.

One such beneficiary, Mahima, pursued a diploma in chemical engineering with the support of the scholarship. Learning about the program through a women's club, she found the financial assistance crucial in alleviating the burden of her education. Despite some challenges with the amount not fully covering her expenses, Mahima successfully transitioned into employment, highlighting the positive impact of the scholarship on her academic and career advancement.

Similarly, another beneficiary enrolled in an MA in Sanskrit found the scholarship beneficial for covering her educational expenses. She commended the program's streamlined application process and expressed satisfaction with its effectiveness in meeting her financial needs.

A commerce graduate also benefited from the scholarship, utilizing the funds to support her future educational pursuits. While facing no specific challenges in accessing the scholarship, the graduate emphasized its usefulness in alleviating financial burdens for needy students. Her positive experience underscores the program's effectiveness in assisting students like herself.

Furthermore, another beneficiary pursuing a BSc in Chemistry shared her experience with the Shree Darbari Sheth Scholarship Program. Despite encountering challenges with the application process, she found the scholarship invaluable in easing the financial burden on her family and facilitating her academic journey.

The interactions highlighted the transformative impact of TCSRD's scholarship projects on students' lives, enabling access to education and fostering career advancement. When asked about any suggestions the beneficiaries have for improving the project, the students expressed satisfaction and willingness to recommend the scholarships to their relatives and friends.

2.2. Quality of Education

Quality education extends beyond knowledge acquisition; it encompasses critical thinking, problem-solving, and communication skills crucial for navigating an ever-changing world. Investing in initiatives like curriculum enhancement, teacher training, and innovative teaching methods ensures students are equipped for academic success and active engagement in society and the workforce. In the Mithapur region, most of TCSRD's educational efforts focused on improving education quality. These efforts included directly implementing various interventions and partnerships with other organizations and providing financial support to advance this regional objective.

2.2.1. The Learning and Enhancement Programme (LEP)

The Learning and Enhancement Programme (LEP) addresses the transportation challenges hindering access to education for primary-level students by establishing dedicated learning centres in rural villages. These centres provided educational sessions directly within communities, focusing on students from 1st to 8th, particularly those transitioning to conventional schooling after the 5th standard. At the time of assessment, LEP operated in three villages: Khatumba, Batisa, and Poshitra, with village-level tutors appointed by TCSRD conducting the sessions.

TCSRD also supplied class stationery items and offered special sessions for students preparing for competitive exams like Navodaya entrance exams and the Pre Metric Scholarship Scheme - PMSS. Balmitra, the village-level tutor, facilitates activities such as mainstreaming students, organizing SMC/Parent meetings, and supporting sports programs. The project aims to reduce dropout rates and improve educational quality and frequency, addressing the need for more transportation prevalent in rural areas. Through these efforts, LEP seeks to enhance academic outcomes and opportunities for students in underserved communities.

One village-level tutor from Khatumba village who had been part of the project for the last eight years expressed his experience as follows:

“Initially, the program encountered challenges in mobilizing children to the learning centres 1-2 km from their villages. Despite these hurdles, a centre was established in Ashapura village's temple around a decade ago, followed by the creation of the Village Learning Centre in Khatumba village in 2017”.

The program's design was tailored to the diverse needs of students, with a focus on practical learning approaches that resonated with their understanding levels. Observations revealed that graduates from the LEP often transitioned to regular schools for further education, showcasing the program's effectiveness in preparing students for mainstream education.

Regular assessments, including weekly tests in nearby schools and bi-weekly exams at the centres, helped monitor students' progress. Community stakeholders actively supported educational activities, offering praise and recognition to encourage participation.

The impact of the LEP was evident in the dwindling dropout rates, with participants showing remarkable enthusiasm for learning, a stark contrast to historical data. Active participation in school activities further underscored the program's success, demonstrating its positive influence on student engagement and community involvement.

Continuous improvement remained a key focus, with ongoing efforts to enhance teaching methodologies and monitor student achievements through regular assessments. Overall, the LEP was a testament to the transformative power of community-driven educational initiatives in fostering academic success and social empowerment.

2.2.2. Quality Education Enhancement Program by CSPC

TCSRD served as the funding partner for CSPC’s (Coastal Salinity Prevention Cell) educational intervention aimed at addressing the increased dropout rate caused by seasonal migration and the impact of the COVID-

19 pandemic on learning levels. Key activities included setting up libraries to counteract student inactivity following the COVID-19 break, providing teacher training and capacity building, strengthening SMC committees, and conducting training, awareness, and involvement programs at the school level. The intervention targeted students in grades 1-5.

Initially, the program covered 42 villages and 96 schools in 2020-21, which slightly decreased to 91 schools in the subsequent years. Despite this reduction, the program maintained coverage of around 5000 students across the assessment period. Consistency was observed in the distribution of resources, with approximately 90 library and math kits provided to schools each year. Additionally, the teacher training aimed at improving teaching quality, particularly for grades 1-5, was a consistent feature of the program. However, it was noticed that special training in math, language, and library management was omitted in 2022-23. The frequency of parental and School Management Committee (SMC) meetings remained high throughout the assessment period, with more than 3000 parental meetings conducted and SMC meetings held at varying frequencies each year.

Overall, the CSPC program experienced a peak in activity during 2021-22, with increased numbers of schools covered compared to the previous and subsequent years. However, the reduction in coverage in subsequent years suggests a possible scaling back of the program's activities.

Education - (CSPC)						
CSPC	**17-18**	**18-19**	**19-20**	**20-21**	**21-22**	**22-23**
Villages	24	24	42	42	42	42
Schools	26	26	96	96	91	91
Students in Schools (Grade 1-5)	968	957	5,000	5,000	5,000	5,000
Govt Schools Teachers (Grade 1-5)	0	0	300	400	490	150

Govt school teachers trained (Language, Maths & Library)	0	0	0	200	400	0
Library Kits for Govt Schools	19	0	0	91	96	102
Maths Kits for Govt Schools	19	0	0	91	96	91
Volunteer classes conducted	0	0	0	90	80	80
School Management Committee meetings	62	130	51	122	302	271
SMC members trained	503	897	140	1,191	1,000	1500
Parents contacted (parenting workshop)	68	92	11	0	450	119
One-on-one meetings with parents	0	0	1,000	3,000	4,000	3,121

Table 4: Details of the CSPC Program from FY 2017 to FY 2023

The assessment interviewed Teachers, Students, the CSPC Project team, and students who benefited from the capacity-building, training, and awareness sessions across Arambhada, Ghadechi, Batisa, and Bhimrana villages. The student respondents were between 7 and 12 years old, while the teachers ranged in age from 29 to 35.

The teachers have been part of the project for 8-9 years, receiving training on diverse topics such as number knowledge, language skills, and practical mathematics. They have integrated these learnings into their daily teaching activities, utilizing Teaching-Learning Materials (TLM) and engaging students through activity-based learning methods.

"*Currently, we engage in various interactive activities with students to foster connection and improve our teaching methods. These workshops on TLM, language, and number knowledge, provided through the TCSRD program, have greatly facilitated our ability to assist students in their studies. We have undergone training sessions four times, which have significantly streamlined our teaching process.*" - Teacher, Batisa Primary School.

Regular assessments and workshops organized by TCSRD representatives have enabled teachers to monitor student progress effectively and tailor their teaching methods accordingly. As a result, they have observed significant improvements in student learning outcomes, with notable enhancements in subjects like mathematics and science.

"To improve students' grasp of science topics, especially in grades 7 and 8, I taught subjects like Electric Transport, Lighting Change, and Magnetic Force through activity-based learning approaches. By incorporating hands-on activities, students retained information effectively and understood these concepts better. Through such engaging methods, I have noticed a significant increase of 45% in students' subject knowledge." - Teacher, Gadechi Primary School.

Additionally, the CSPC program has facilitated the establishment of school libraries, providing students with access to a wide range of educational resources. Students have become more engaged with reading and learning, reflecting on the meaning of what they have learned and sharing their insights with their peers.

"Earlier, our school did not have a library corner, but through the efforts of CSPC representatives, the importance of the library was conveyed to students through activities. The school organized a rally involving all teachers and students to raise awareness about the library. A suitable space was identified, and a library corner was set up. Students visit the library to read stories, songs, grammar books, shadow books, and awareness books. They return books on time and provide feedback after reading them." - KII with Teacher, Batisa Primary School.

Despite the initial reluctance among students to attend the learning centers and limitations of transportation, with continuous support from the TCSRD team and the community, these challenges have been addressed, empowering students to overcome obstacles and embrace education wholeheartedly.

The TCSRD's initiatives under the CSPC project have significantly transformed the educational landscape in multiple villages. Interviews with teachers and students reveal notable advancements in refining teaching techniques, improving student learning outcomes, and boosting community engagement. Teachers and

students alike look forward to additional improvements, particularly in ensuring transportation services for students residing far from learning centres, quarterly teacher training to stay updated on teaching methodologies, and awareness campaigns to involve village residents in understanding the significance of education for equitable access to learning.

2.2.3 The Learning and Migration Program - LAMP

The Learning and Migration Program (LAMP) of the American India Foundation has played a pivotal role since its inception in 2004, spurred by the aftermath of the 2001 Kutch earthquake, with support from the American and Indian governments. TCSRD partnered with AIF as a funding supporter for this initiative. Initially, the focus was on assisting salt mine workers and addressing migration issues stemming from limited employment opportunities. However, the program has undergone significant evolution since then. Guided by access, quality, governance, and influence principles, LAMP strategically expanded its reach and impact across various regions through partnerships with five other organizations: Unnati, Aga Khan Rural Support Program (AKRSP), Sarthi, Shikshan Ane Samaj Kalyan Kendra (SSKK), and Swadeep.

In its initial phase, LAMP concentrated on establishing Seasonal Hostels to provide educational opportunities for children affected by migration. Over time, the program broadened its scope to encompass other segments. The program comprised three types of interventions operating under the umbrella of LAMP.

- The Learning Enhancement Program (LEP) targeted students in grades 3-8, aiming to improve their academic performance. Selected through a baseline assessment at the start of the academic year, these students received special classes after school.
- Learning Resource Centres (LRC) catered to grades 6-8 students, focusing on Science and Math. These centres, equipped with libraries and other learning resources, were established in villages for student access.
- The Spoke program concentrated on language building, employing a destination model in a cluster-level approach connecting schools from grades 3-5. This cluster-level strategy facilitated program integration into the broader educational landscape, enhancing accessibility and education quality.

Following the implementation of the Right to Education Act in 2019, the initiative also included capacity-building activities for School Management Committees (SMCs), Panchayat Raj institutions (PRIs), and citizen educators or youth groups.

The program covered 8 districts of Gujarat, across 154 villages and schools. Subsequently, there was an expansion to 161 villages and 169 schools in 2022-23, indicating an increasing reach and engagement with communities over time. Among the 8 districts, TCSRD is funding for 5 districts- Morbi, Kutch, Amreli, Bhavnagar, & Mahisagar.
The total number of community members experienced a significant increase from 6553 to 8288 in 2021-22, suggesting successful outreach efforts and heightened community involvement. Additionally, there was an increase in the number of SMC members trained during this period, indicating a strengthening of local governance structures and capacity building within the communities.

Furthermore, the surge in youth volunteers trained, also known as citizen educators, in 2022-23 highlighting active mobilization efforts and the cultivation of local leadership within the program during that year. This influx of trained volunteers likely contributed to enhanced community engagement and program effectiveness. The consistent increase in the total number of children covered under the program year by year reflects the program's success in expanding access to educational opportunities and services for children within the targeted communities. However, it is worth noting a slight decrease in the number of children participating in the library program in 2021-22, followed by an increase in the subsequent year.

Education - (LAMP)						
Parameters	**17-18**	**18-19**	**19-20**	**20-21**	**21-22**	**22-23**
Districts covered	7	8	9	8	8	8
Villages covered	383	266	231	154	154	161
SMC/Schools covered	391	241	206	154	154	169
Total Community members reached	15,408	5,573	7,396	6,553	8,288	8,842
Total SMC Members trained	1,700	549	637	571	1,022	876
Total PRI Members trained	593	185	312	290	372	459
Total citizen educators (youth volunteers)	1,382	445	1,092	581	562	1,567

Total children covered (LRC-Hub Centre, Spoke schools and LEP classes)	8,097	7,405	6,195	4,426	4,889	6,459
Children covered (seasonal hostels)	179	110	0	0	1,389	788
Total children covered (library program)	0	0	801	246	211	337

Table 5: Details of the LAMP Program in 8 districts of Gujarat

The distribution of students enrolled in the LAMP program shows a notable trend towards representation from marginalized communities, particularly the Scheduled Castes (SC) and Scheduled Tribes (ST). Within these communities, the data reveals a significant proportion of students hailing from the ST category. Such a pattern may reflect the targeted outreach efforts of the program towards historically disadvantaged groups and underscores the importance of addressing educational disparities among these communities.

Total children covered under LAMP	SC	ST	Total SC/ST	Total Students
LEP	42	497	539	839
LRC	60	838	898	1,275
SPOKE	160	2,498	2,658	4,345
Seasonal Hostel / Care Givers	10	460	470	788
Total Students	272	4,293	4,565	7,247

Table 6: Total children covered under LAMP

The program's success was attributed to its comprehensive approach involving direct implementation under TCSRD and partnerships with other organizations. The program's design underwent meticulous development through collaborative efforts involving grassroots workers, professionals, and community stakeholders, who identified specific needs through comprehensive brainstorming sessions.

The region served by LAMP faced various challenges related to the community and geographical context. These challenges included parental unawareness about education's importance, geographic remoteness,

lack of transportation infrastructure, high dropout rates among girls, and a shortage of qualified teachers. These difficulties were exacerbated by challenging working conditions and limited resources.

In response, LAMP implemented tailored strategies to address these challenges. These strategies aimed to increase community engagement, enhance monitoring and evaluation mechanisms, and improve program effectiveness. Committees comprising representatives from School Management Committees (SMCs), youth groups, government teachers, and AIF team members played crucial roles in ensuring accountability and transparency.

I can see that the attitude towards girls' education has changed. We are more confident now that we can convince parents to support their children to pursue education (KII with AIF team).

Continuous monitoring and evaluation, which included baseline and midline assessments, provided valuable insights into the program's impact and areas for improvement. Community-led learning audits and regular field visits by AIF team members further reinforced transparency and accountability. The AIF Project coordinator shared the following information.

"We ensure the community's involvement in the M&E. We have formed committees with members from SMC, youth group, gov teacher, and AIF team. These groups conduct M&E, which is called community lead learning audits. We give the most importance to accuracy, and cross-verifications are conducted at every process. District-level SMC committees are formed and are involved in the processes. We gave it to the community; they do it themselves. Annually, it is presented to the community on how the program ran, its impact and progress, all the data are presented and discussed with the community to ensure transparency".
- (KII with AIF Coordinator)

Despite the challenges in the region, LAMP demonstrated tangible positive outcomes, especially in increased retention rates, improved attitudes toward education, and enhanced leadership skills among community stakeholders. As per the feedback received from the community, the expansion of LAMP projects to other villages, especially LRCs, can make the change in the context of rural Gujarat. The program played a crucial role in empowering girls to pursue education beyond traditional norms, significantly reducing dropout rates.

"LEP and LRC help with reducing the stress levels of students. Our activities are based on peer learning, group learning and performance level. Students participate more in national and district-level programs.

From 2017 onwards to 2022, there were 193 students involved in LEP and LRC. All of them are still pursuing their education. None of them have dropped out. 117 among them are girls. Before, the girls were encouraged to stop studying after 8th due to social and security issues. Right now, there is an evident impact". (KII with AIF Coordinator)

Impact	2020-21	2021-22
Improvement in the LAMP-LEP (Language-Maths)-Std. 3-5	18%	22%
Improvement	20%	20.85%
in the LAMP-LRC (Science)-Std. 6-8		
Improvement in the LAMP-Spoke (Language)-Std. 3-4	18%	21.53%

The available data spanning from 2020 to 2022 demonstrates a marked and consistent enhancement across all three programs encompassed within LAMP. Each year showcases an approximate 20% increase in performance or efficacy within these programs. This progressive trend indicates a concerted effort towards the refinement and optimization of LAMP initiatives over the specified timeframe. Such improvements could stem from various factors, including targeted interventions, enhanced resource allocation, and refined methodologies employed within the programs.

2.2.4. Village Learning Centres (VLC) - Eklavya education project

TCSRD focused on enhancing the education of children aged 6-14 in government schools by establishing additional learning resource centers. Village learning centers were established in the Mambattu and Cuddalore regions of Andhra Pradesh & Tamil Nadu.

In the Mambattu and Cuddalore regions, there were 14 and 10 VLCs, respectively, with one in each village, active for over five years, serving students from grades 1 to 10. These centers operated in community halls constructed by TCSRD, catering to approximately 3000 students from both regions.

The centers offered special tuition classes conducted by TCSRD-employed tutors and community volunteers to reduce school dropouts and foster a learning culture among children. Additionally, the centers served as a resource for the community, particularly youth, preparing for government exams. This addressed challenges such as the need for a conducive study environment at home and waning interest in education.

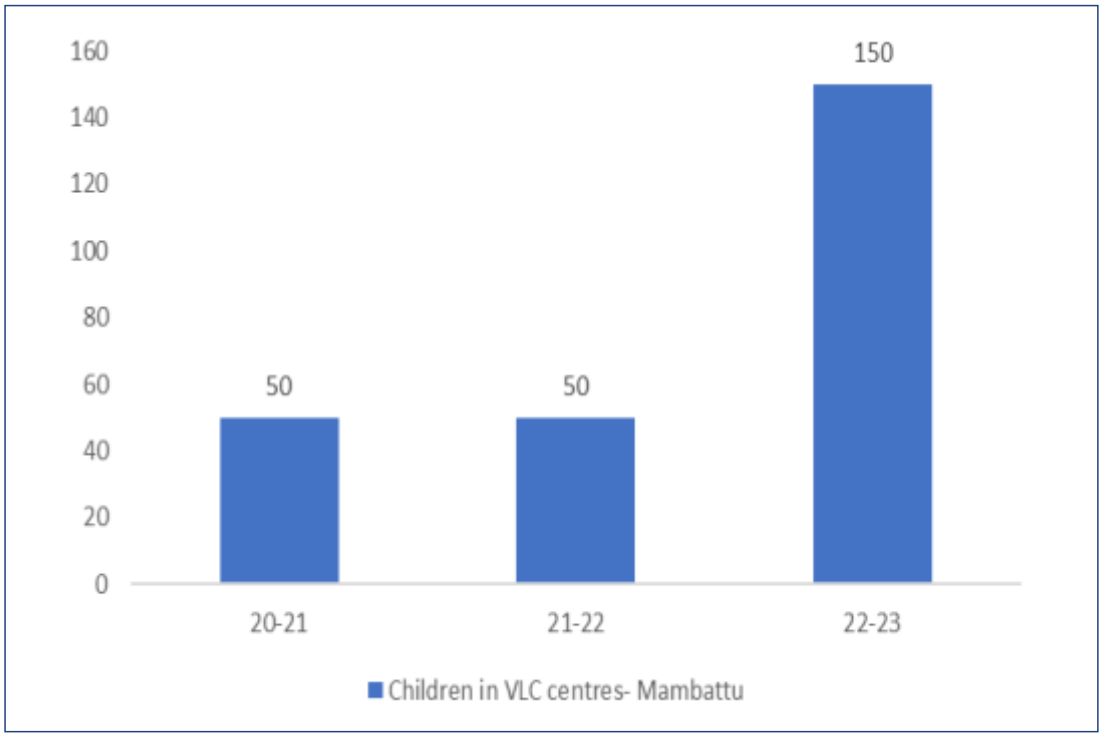

Figure 2: Total number of children in Mambattu VLC Centres from FY 2020 to FY 2023

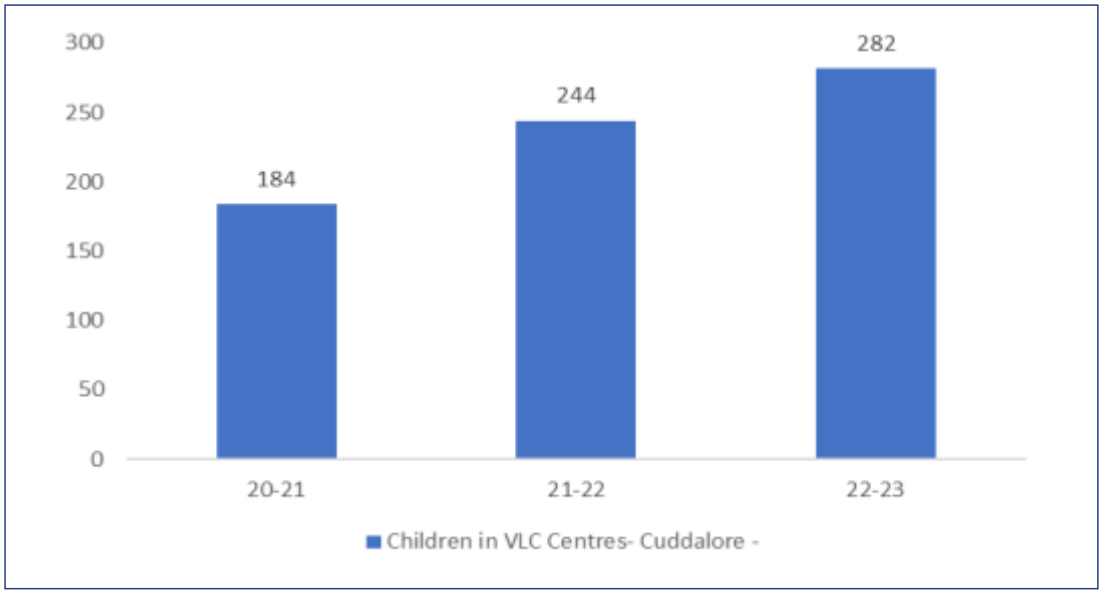

Figure 3: Total number of Children in Cuddalore centres from FY 2020 to FY 2023

Upon reviewing the data, it became apparent that there was a consistent increase in the utilization of services provided by VLCs over the years. Additionally, a noticeable disparity in usage rates between VLCs in Cuddalore and Mambattu is observed. The data indicates that a greater number of children utilized the services offered by VLCs in Cuddalore compared to those in Mambattu.

The centres were also used by the community, especially youth in Cuddalore, to prepare for government exams, addressing challenges of lack of study environment at home and lack of interest in pursuing education.

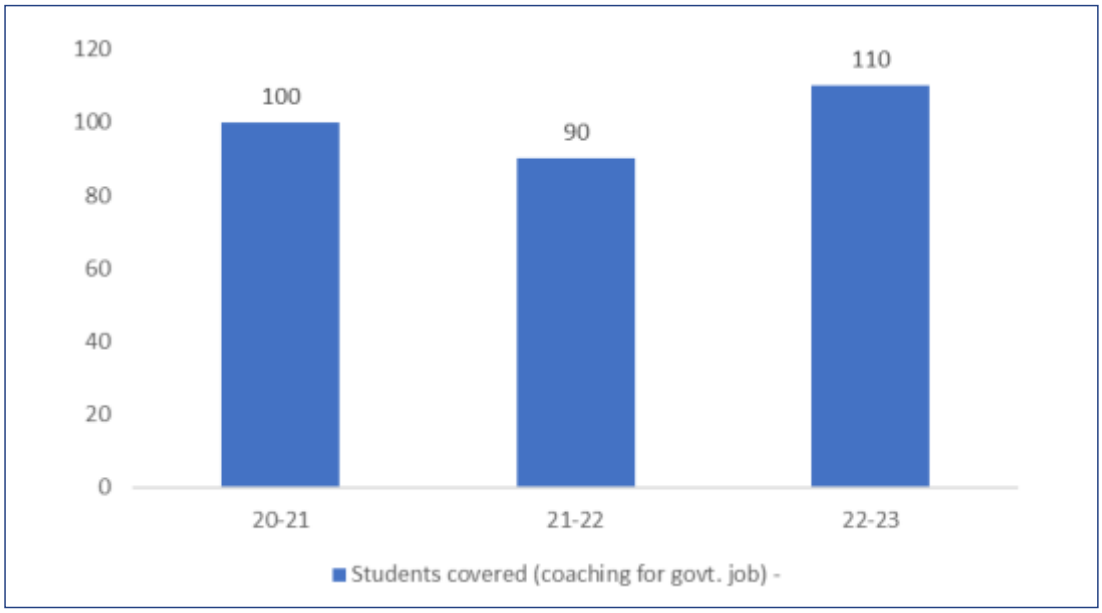

Figure 4: Total number of students covered in Cuddalore centre for government job coaching from FY 2020 to FY 2023

The study interacted with students and trainers from VLCs of Mambattu and Cuddalore and a project team member from Mambattu to understand their experiences of partaking in the initiatives.

The Village Learning Centres project aimed to enhance educational opportunities and combat school dropout rates in rural areas of Mambattu and Cuddalore regions . Established about five years ago, the project primarily targeted children who faced challenges in accessing educational support due to various reasons, including financial constraints and lack of infrastructure.

The project depended on committed trainers who offered teaching and assistance to students, each bringing a practical approach to engaging learners. The centers had varying infrastructure, with some having boards, mats, and basic teaching aids along with sanitation facilities, while other community halls lacked sanitation facilities. Teaching methods in the VLCs included using boards, one-on-one interactions, and organizing extracurricular activities. They covered math, science, language, and extracurriculars like drawing and project work.

Community involvement was integral to the project's success, with parents and local stakeholders actively supporting the centers. While the primary focus remained on academic support, the centers also served as community hubs, promoting collaboration and support among residents.

Trainers monitored student progress through various methods such as tests, homework evaluation, and behavior observation. Regular evaluations helped assess the project's effectiveness and identify areas for improvement. Trainers identified students' attendance improvement and engagement with the class teachers. Success stories highlighted the project's positive impact on students' academic performance and life skills.

"Students attend school regularly, maintaining good attendance, and the dropout rate has decreased. They are studying diligently, showing a keen interest in learning, and actively interacting with school teachers to monitor their progress. Additionally, students have improved their academic performance, with some achieving first to fifth ranks and demonstrating increased confidence in speaking." - Trainer from Sami Nagar, Cuddalore.

Students expressed gratitude for the support received from the VLCs, noting improvements in academic performance and confidence. They also emphasized the need for additional resources and activities to enhance learning experiences.

"My teacher is excellent, and I've learned much about maths and all other subjects. My father is pleased with my performance." - 3rd Class Student, Mambattu.

"Before joining the project, I struggled to participate in speech competitions at school. Learning was challenging, and achieving good grades or ranks was difficult. However, since joining the project, I have significantly improved my academic performance. Now, I can score good marks and even secure ranks in my class." - 9th Class Student, Cuddalore.

To ensure long-term sustainability, plans for digital learning, infrastructure development, and expanded collaboration with organizations and stakeholders were under consideration. Opportunities for improvement included introducing spoken English classes, sports activities, and digital learning initiatives.
The project effectively offered more than 3000 students extra educational support from the initiation through tutoring sessions held in community halls across 24 villages. It resulted in noticeable improvements in students' academic performance and overall confidence. Suggestions for improving the project include investing in digital infrastructure and introducing spoken English classes and sports activities.

2.2.5. World On Wheels (WOW) Bus

Introduced in 2018, the Mobile Bus initiative aimed to enrich students' engagement and understanding in science, mathematics, and computer science. Specifically tailored for students in grades 6 to 8, these sessions provided targeted educational support within this age bracket. The initiative featured a custom-designed 24-seater computer training bus equipped with IT facilities, all powered by sustainable green energy sources. Operating every month, the bus visited around 25 schools in the Okhamandal area.

It followed a structured schedule, spending three days per week visiting nearby villages and extending its reach to more distant ones during the subsequent three days. The curriculum onboard the Mobile Bus predominantly focused on computer education, offering modules to enhance students' digital literacy. Moreover, during school visits, the initiative conducted interactive sessions on various science topics, utilizing Information, Education, and Communication (IEC) materials to facilitate a deeper understanding of the subject matter through enjoyable activities.

The WOW Bus project, implemented by TCSRD, aimed to connect students in rural communities with digital technology to enhance their understanding of various subjects, particularly science and technology. The project involved collaboration with schools, teachers, trainers, and students to facilitate learning through computer-based activities conducted on the bus.

The study interacted with over 70 students from 6th to 8th standard across villages, teachers, trainers, and other stakeholders involved in the project.

Teachers and trainers were observed to have played a crucial role in implementing the project, providing insights into students' challenges and the WoW Bus's impact on their academic performance. The teachers highlighted the positive changes observed in students' engagement, academic growth, and interest in subjects like mathematics and science. However, they also emphasized the need for more frequent visits from the bus to ensure sustained impact and provide continuous support to students.

"Since the WoW bus was introduced in our school, I've noticed a remarkable shift in students' attitudes towards learning. The interactive sessions on the bus have sparked a newfound interest in subjects like science and mathematics among those who previously struggled with them. It's incredible to see how students who once found these subjects daunting are now actively participating in discussions and confidently answering questions on topics they've been studying." - Teachers from Gadechi Primary School.

"Previously, students struggled to respond adequately. However, during our recent visits to the school, I noticed a significant improvement as students now answer questions confidently. They actively inquire about various activities and enthusiastically participate in computer, science, and maths-related tasks." - WOW Bus Trainer.

Students shared their experiences participating in the WoW Bus activities, expressing enthusiasm for learning new subjects and using digital tools to enhance their understanding. They mentioned memorable lessons on topics like the digestive system and the use of computers in education. Students also noted improvements in their academic performance, confidence, and self-esteem due to their participation in the project.

"Learning to use the computer has helped me overcome many difficulties I encountered in understanding science. This newfound skill has significantly improved my comprehension of scientific concepts compared to before." - FGD with Students, Gadechi Village.

Local stakeholders, including community leaders and NGOs, supported the project and advocated for its expansion to reach more students. They emphasized the importance of ongoing monitoring and evaluation to ensure the project's long-term success and sustainability.

Overall, the WoW Bus project served as a transformative initiative, providing students in rural areas with access to digital learning opportunities and fostering their interest and engagement in education. However, stakeholders identified areas for improvement, such as increasing the frequency of bus visits and providing additional resources to support students' learning needs, especially for teaching maths and science.

2.3 Analysis

Themes	Analysis
Relevance	• The Okhamandal region, characterized by high dropout rates among students and significant outward migration from villages, necessitates interventions aimed at encouraging educational continuity. These interventions should include provisions for financial assistance, improved learning access, and opportunities for students who lack adequate educational support. TCSRD undertook various initiatives to address these pressing needs within the sub-thematic areas of Continuity of Education and Quality Education. These initiatives included scholarships,

	establishment of village learning centers, deployment of mobile buses equipped with learning facilities, and teacher training programs. Such interventions were crucial for addressing educational challenges in this region and ensuring equitable access to quality education for all students.
Effectiveness	• The six targeted initiatives within the Continuity and Quality of Education sub-themes aimed to address various essential objectives. • The tailored scholarship projects provided opportunities for students to continue their education from the 9th standard onwards, enabling them to pursue graduation and post-graduation studies. The scholarships helped the students continue their education and get relief from the financial duress. • The LEP program focused on addressing challenges faced by primary school children, such as transportation issues and lack of educational facilities in villages, by establishing learning centers assisted by village-level tutors called Balmitras. These centers provided students with tuition and monitored their progress, resulting in improved attendance, learning abilities, and confidence. • The CSPC program aimed to reduce dropout rates among students in 42 villages of Okhamandal due to seasonal migration and the impact of COVID-19. It achieved this through initiatives such as setting up libraries, teacher training, School Management Committee (SMC) meetings, and capacity-building activities, primarily targeting students in grades 1-5. This project helped teachers enhance their subject understanding, thereby improving pedagogy, while the establishment of school libraries enhanced students' reading abilities and comprehension. These activities led to improved learning outcomes for students and increased engagement by teachers and the community in students' learning. • The LAMP program comprised three sub-projects focused on improving learning outcomes for students in grades 3-8. These sub-projects included Learning Resource Centers to enhance math and science education, the Spoke program to develop language skills among students in grades 3-5, and the establishment of libraries and provision of learning materials. These initiatives, implemented under a hub and spoke model, contributed to improved retention rates, a positive attitude towards education, and enhanced leadership skills among community members. • The VLC program focused on enhancing education of rural students aged 6-14 years studying in the Govt. schools in

	Mambattu and Cuddalore region. The centers provided special tuition classes to school dropouts and effectively improved their academic performance and overall confidence. • WOW Bus program focused on enriching students' engagement learnings and understanding of science, math and computer science through digital learning equipped with a 24 seater computer training mobile bus. The project provided students easy learning of difficult topics of science and math and created interest in computer education. • Overall, the initiatives within the Continuing and Quality Education support projects have resulted in improved student attendance, learning capabilities, educational outcomes, teacher pedagogy, and community engagement in adopting educational initiatives at the village level, and reached their intended goals.
Efficiency	• Among TCSRD's initiatives, educational projects received the highest budget allocation, totaling over 502.5 lakh rupees, invested in various interventions. From 2020 to 2023, these projects reached over 71 thousand individual beneficiaries, including students, teachers, and parents across Gujarat, Andhra Pradesh, and Tamil Nadu. Utilizing existing infrastructure such as community halls, village centers, schools, and local trainers, the project efficiently utilized resources to reach a maximum number of needy students.
Coherence	• The project aimed to enhance the existing education system by introducing various initiatives such as village learning centers, library setups in schools, scholarships, and a mobile bus for teaching computer education. These efforts complemented the existing school facilities and involved teachers and local trainers through capacity building to address the urgent needs of students, including reducing dropout rates and mitigating the impact of COVID-19 and prevalent migration on learning outcomes. Additionally, the project collaborated with multiple reputable NGOs to expand its reach and leverage collective capabilities for the greater good. It also engaged local governments and community members as key stakeholders in the program. Nationally and internationally, these initiatives contribute to meeting the critical requirements of providing quality education and ensuring continuity in education from primary education to higher education.
Impact	• The project has facilitated educational continuity through a range of initiatives. Tailored scholarships, village learning centers offering specialized tuition, and teacher training programs have provided enhanced learning opportunities. Additionally, the introduction of mobile education units and school libraries has expanded access to resources. Engaging local youth and teachers

	to support dropout students and those preparing for competitive exams has been pivotal. These efforts collectively resulted in a significant reduction in dropout rates, improved student attendance and engagement, enhanced comprehension, reading, and language skills, and better pedagogical abilities among teachers. Moreover, increased parental and community involvement has fostered a supportive educational environment. By alleviating transportation barriers to access tuition and offering computer-based learning, the project has further enriched the learning experience. Overall, it has successfully ensured educational continuity for eligible students and delivered quality education to all participants.
Sustainability	• The project's impact on beneficiaries, including enhanced confidence, improved learning outcomes, and sustained educational continuity, remained evident even after a year. Beneficiaries expressed positive recall of the various educational initiatives and credited their academic success to these programs. As a result, the project has maintained its intervention impact over time. However, there are opportunities for improvement, such as increasing scholarship amounts for pre-graduation students, providing bicycles to students to mitigate geographical barriers, enhancing the frequency of teacher training sessions, and renovating village learning centers with digital equipment to facilitate curriculum delivery and enhance subject comprehension among students.

Table 7: Analysis across REECIS parameters

2.4 Practices Worked Well & Not Working Well

Project	Activity/Practices	Worked well	Can be improved
Continuity of Education	Financial support through scholarships	The provision of scholarships assisted students in covering some of the expenses associated with attending schools and colleges, thereby offering valuable support to them.	More proactive efforts were needed to engage parents and students, as many were not fully aware of the specific scholarships they were benefiting from at the time.
Quality of Education	Library setup and providing teacher learning material (TLM) under the CSPC program	This program helped teachers improve their teaching methods and actively engaged them in monitoring and supporting student	

		progress. Furthermore, the establishment of libraries encouraged students to cultivate reading habits.	
	Setting up of learning centers at remote villages (LEP Program)	The Learning Enhancement Program (LEP) effectively facilitated students' access to classes and education in remote areas, proving advantageous for villages situated in distant locations.	
	Conducting classes for Science, maths, and computer classes through WOW Bus	The WOW Bus sparked increased interest among children in Science, Mathematics, and Computer Science. Students benefited from engaging in practical exercises.	
	Village learning centres in Mambattu and Cuddalore	Village learning centers play a crucial role in reducing school dropout rates and supporting children in completing their elementary education. These centers not only provide educational resources but also foster an environment that increases students' interest in their studies.	The infrastructure of the Cuddalore Village Learning Center requires improvement, particularly in Mambattu where adequate space for the center needs to be provided.

Table 8: Output Achievement Matrix of Education Projects

2.5 Recommendations

1. Amount of Scholarship should be revised

During primary research, feedback from scholarship beneficiaries (specially college students) indicated that the current scholarship amount should be increased. It is recommended to revise the scholarship amounts based on the financial condition and the academic program of the college that the students are enrolled in.

2. Training should be increased for the teachers under the CSPC program: Teachers value the training programs provided by CSPC and suggest increasing the frequency of workshops. They proposed scheduling sessions every three months to facilitate continuous improvement and the adoption of various teaching methods. By offering regular training opportunities, CSPC could empower teachers to remain updated with the latest educational approaches and foster even more engaging learning experiences for their students.

3. Providing cycles to the Students (LEP Program)
The distance between the villages and the school, spanning approximately 1-2 kms, presents a significant commuting challenge for students. In response, the LEP (Learning Enhancement Program) has been implemented. Rather than establishing a center, providing bicycles to students can address commuting challenges and promote regular attendance. Moreover, to tackle the shortage of teachers in the school, the implementation of a Teacher-Aid program will be helpful. This initiative would involve employing LEP Program learning assistants as volunteer educators, thereby offering support to the teaching staff in the school.

4. Proper study space for Village learning centres in Cuddalore and Mambattu
Based on our discussions with the team, it has been observed that the infrastructure of the village learning centers is inadequate and in need of renovation. It is recommended to establish proper study spaces at both locations Cuddalore and Mambattu with aesthetic enhancements that inspire students to engage in continued learning at the center.

5. Improvement in the model of WOW Bus (Reference of Agastya Model): The WOW Bus program could have been enhanced by integrating elements from the Agastya Model's Doorstep Science and Maths Mobile Lab. This model utilized mobile labs for interactive learning experiences, effectively addressing shortcomings in the existing government curriculum. By integrating these mobile labs, the WOW Bus program could have delivered innovative learning methods through hands-on science and maths activities, bridging knowledge gaps and fostering interest in the subjects. Furthermore, the Agastya Model emphasized peer instruction and leadership, where selected students were trained to guide their peers. The WOW Bus program could adopt this approach and workshops on creative learning methods to empower students and create a more engaging learning environment.

6. Alternative solution for more space in the WOW Bus: An alternative approach could have been integrating foldable furniture, equipment, and modular storage solutions. This would have allowed for optimizing the bus interior to accommodate a broader array of educational materials and activities while still ensuring convenient mobility. Furthermore, creating workspace or activity areas outside the bus could have expanded the available space for learning and engagement.

7. Increase in manpower for WOW Bus: For the WOW Bus program to effectively deliver its science and maths classes, increasing the number of staff was deemed necessary. This additional manpower could have created a more supportive learning environment by allowing for smaller student-to-instructor ratios, facilitating differentiated instruction, and providing better activity supervision.

8. Involvement of Parents, teachers, and SMC Members: Primary research indicates a need for more awareness among parents, teachers, and School Management Committee (SMC) members regarding TCSRD education programs within the school. Parents and students need to be aware of the scholarships they can benefit from, while SMC members are unfamiliar with the Learning Enhancement Program (LEP) and CSPC Program. Additionally, some teachers need more knowledge to provide insights about the

programs. Addressing these gaps requires concerted efforts to involve and educate stakeholders about all available programs actively. This may involve conducting awareness sessions, distributing informational materials, and fostering open communication channels to understand the programs and their benefits among all stakeholders comprehensively.

9. Team coordination among the projects: There needed to be more coordination among teams working on various projects within the same schools, and teachers struggled to communicate program activities accurately. It was crucial to establish better communication channels and coordination mechanisms among project coordinators and school staff to resolve this issue. Regular meetings and collaborative planning sessions were needed to enhance awareness and understanding of all ongoing projects in the school. Overall, improved team coordination and communication were essential for maximizing the impact of multiple projects within schools.

Section 3 : Skill Development

3.1. Overview & Impact of Projects

The employment gap in our country poses a significant challenge to economic development, particularly in rural areas where agriculture is the primary source of livelihood. However, regions facing issues like low rainfall and groundwater scarcity have limited opportunities in agriculture, leading to rural youth migrating to cities for low-paying jobs. Addressing this issue requires generating employment opportunities locally or equipping youth with skills for better job prospects in nearby urban areas.

To tackle this challenge, TCSRD conducts various skill development programs to provide rural youth with employable skills and foster entrepreneurship. These interventions are based on assessments of local needs and opportunities, identifying skills in demand for planned execution.

In states like Gujarat, Tamil Nadu, Andhra Pradesh, Maharashtra, West Bengal, and Uttar Pradesh, TCSRD offers diverse skill development courses to meet current and future demands. These programs are delivered through its skill development center in Mithapur, Gujarat, established in 2014, and in collaboration with institutions like Tata Strive, L&T Construction Training Institute, and Industrial Training Institutes (ITIs).

Additionally, TCSRD partners with organizations like Rallis India Pvt. Ltd. and Light of Life Trust (LOLT) to run skills training centers in Maharashtra. Linkages with industries, private organizations, and government bodies are established to facilitate sustainable income through employment and entrepreneurship opportunities.

Below are the skill development programs implemented by TCSRD:

3.1.1 Technical Training Institute (Mithapur):

In 2019, TCSRD inaugurated a Technical Training Institute in Mithapur to provide skill training to the local youth. This institute offered a comprehensive six-month course covering six different trades: welder technician, fitter technician, domestic electrician, fashion &

technology, beauty & wellness, and computer technology. The primary objective was to equip the youth with the necessary skills for various sectors, fostering their readiness for the workforce.

The 6-month training programs at the institute went beyond technical training. They incorporated motivational sessions, 5S training (a five-step methodology for creating an organized and productive workspace: Seiri, Seiton, Seiso, Seiketsu, and Shitsuke), fire and safety awareness, and an Entrepreneurship Development Programme (EDP). Monthly exams were conducted alongside the technical and theoretical components, and the course assessment was undertaken in three stages. Internal teaching staff conducted the first stage, followed by an external agency, and the Sector Skill Council undertook the final stage. Successful students received certificates from TCSRD.

In Figure 5, the data depicts the number of youth trained in Technical Training Institutes, where the years 20-21 and 21-22 have seen reduced participation from youth due to restrictions on movement due to COVID-19. In the three-year assessment period, from FY 20-21 to 22-23, the TTI has trained over a thousand youth annually.

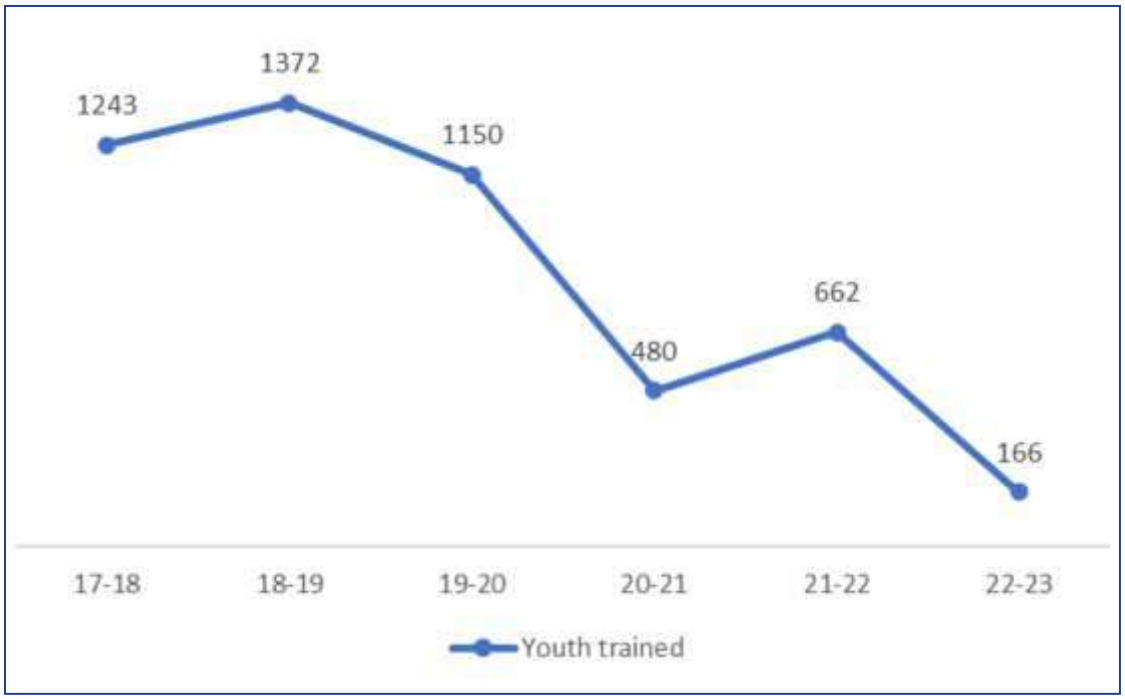

Figure 5: Total number of youth trained and placed from FY 2017 to FY 2023

The institute also facilitated campus placements, inviting representatives from various sectors to recruit students. The youth who have secured employment earn an average monthly income ranging from Rs 9000 to Rs 9500, with annual incomes steadily increasing from 17-18, with a median salary of 1.14 lakhs/annum. Further details regarding the annual revenue of trained youth are provided in Figure 6.

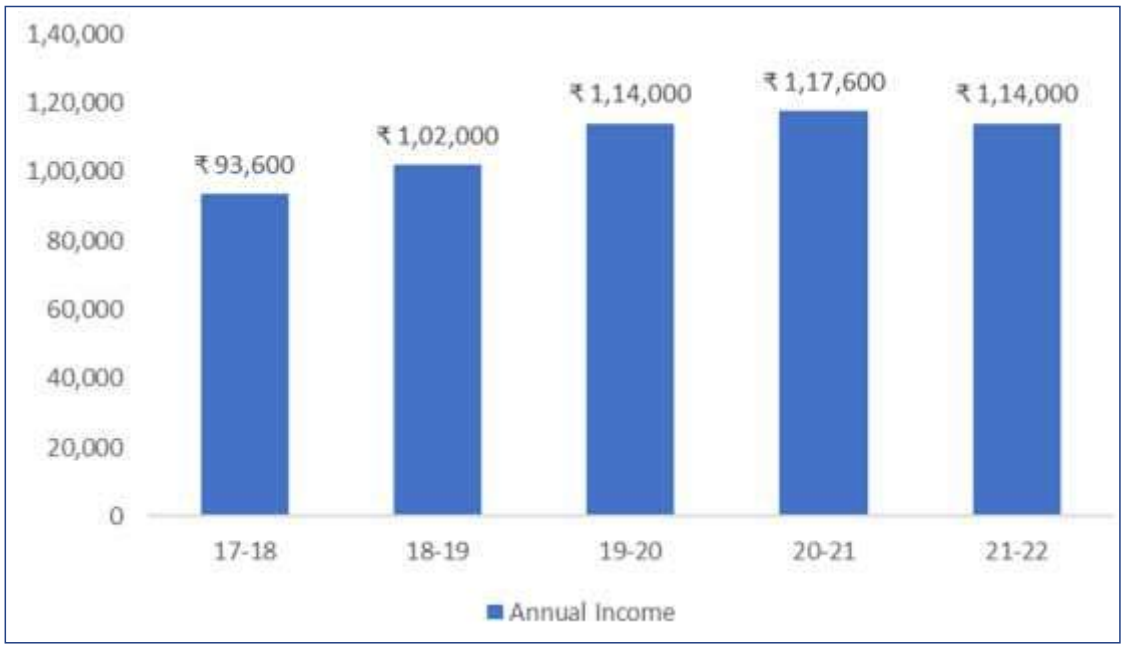

Figure 6:Average annual income of per youth trained and placed from FY 2017 to FY 2022

Notably, during the COVID pandemic, the institute provided online training courses to ensure continuous learning for the students. With well-equipped infrastructure and qualified trainers, the Technical Training Institute in Mithapur was committed to providing quality skill training and empowering the local youth.

Through the primary interactions with the youth, the study found the following observations:

Educational Background and Livelihood Challenges: The respondents came from diverse academic backgrounds, ranging from 9th-grade education to pursuing bachelor's degrees. They highlighted the limited job opportunities in the village, especially outside of major companies like Tata Chemicals or Tata Solar. This scarcity of employment, particularly in non-traditional sectors, poses a significant challenge to youth livelihoods.

“In our village, the primary hurdle for youth in finding livelihood opportunities is the scarcity of jobs. Employment options are primarily centered around companies such as Tata Chemicals or Tata Solar. However, securing suitable employment beyond these options becomes significantly challenging, primarily due to the region's classification as backward.” - Computers Student 1

Discovery and Enrollment: The respondents learned about the TTI courses through various channels like WhatsApp groups, advertisements, friends, and family. They enrolled by filling out forms and submitting necessary documents, indicating a straightforward enrollment process.

"A neighbor who is a trainer at TTI informed me about the training program. I joined the program to enhance my understanding and skills in beauty wellness, building upon my basic knowledge." - Beauty Student 1

Relevance and Importance: The participants found the training program relevant and necessary, offering them opportunities to learn new skills aligned with their interests and enhancing their employability prospects. They expressed the need for such programs in their area, where opportunities for skill development are limited.

"Training programs like these incredibly benefit youth like me, providing practical skills and experiences that complement formal education." - Computers Student 2

Learning and Teaching Experience: The training programs covered various topics, from computer skills to beauty wellness and electrical work, providing theoretical knowledge and practical skills. Trainers employed various teaching methods, including practical demonstrations and audio-visual aids, to ensure comprehensive learning experiences.

"The program has immensely benefited me and other youth in similar circumstances. The training provided insights into CCC software, soft skills, and safety modules, which are invaluable in today's job market." - Computers Student 1

"Learned sewing from scratch during the six-month duration, acquiring various techniques and skills in the process." - Fashion Student.

Employment and Income Generation: Many participants secured jobs or started businesses after completing the training programs. These opportunities significantly improved their economic situations, with some reporting increased income ranging from Rs. 5,000 to Rs. 10,000 per month.

"I earn approximately Rs. 5,000-10,000 per month during the wedding season through my business, but I need some necessary equipment for certain services." - Beauty Student 2.

Infrastructure and Sustainability: The training centers were well-equipped with modern facilities, creating a conducive learning environment for the participants. However, there were suggestions for improvement, such as introducing more advanced courses and enhancing post-training engagement activities to support continued skill development and job placement.

"While the current program was beneficial, I believe that more specific, detailed, and advanced courses would further enhance the skillset and employability of trainees." - Computers Student 3

The Technical Training Institute's activities have positively and transformatively impacted the youth, providing valuable skills, employment opportunities, and avenues for personal and professional growth. Continuing efforts to enhance the program's effectiveness and sustainability will further empower the youth and contribute to the region's socio-economic development.

3.1.2 Saksham Programmes- NABSKILL

In 2021, TCSRD collaborated with NABARD to launch a skill development program called SAKSHAM. The primary goal of this initiative was to prepare youth for employment opportunities and entrepreneurship

ventures. The 45-day course duration program focused on short-term courses aligned with market demand. Notable courses included CCTV Surveillance Systems, Driving, Hospitality Management, Electric Motor Rewinding and Repair Services, Call Centre Training, Machine & Quality Technician (Turner), Fitter Fabrication, Welding & Fabrication, and Forklift Operator. Some courses, such as driving and forklift operation, were tailored specifically for women trainees.

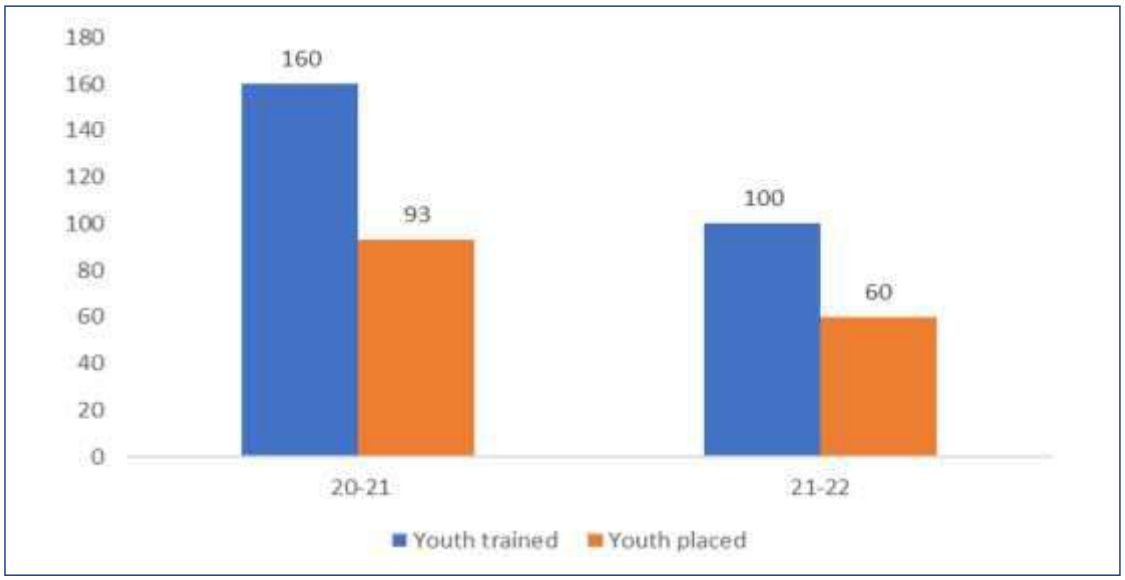

Figure 7: Total number of youth trained and placed in Saksham Programme during FY 20-21 and FY 21-22

During the 2021-22 period, the SAKSHAM program introduced five new courses: Manufacturing and Quality Technician, Micro Irrigation, Refrigeration and Air Conditioning, Computer Hardware and Networking, and Food Processing. These strategic additions aimed to diversify the skill set of trainees further and enhance their readiness for the dynamic job market. After completing the training in the five courses mentioned earlier, 100 youths were trained, out of which 60 secured employment (refer to Figure 7). Additionally, some trained youths have opted to start their businesses. These trained youths earn a monthly income from Rs 6000 to Rs 6500.

The project was launched in collaboration with NABARD and ran from 2020 to 2022, during which it provided training to over 260 women and youth, with 153 of them (59%) successfully placed into various trades. Although the center applied for approval to continue the program in the 2022-2023 academic year, the approval was not received until after March 2023. As a result, the course couldn't take place in 22-23 and resumed in the academic year 2023-2024.

3.1.3 Tata STRIVE:

The Tata Strive Skill Development Centre in Aligarh, established in 2015 through collaboration between TCSRD and Tata Community Initiatives Trust (TCIT), is dedicated to empowering underprivileged youth through skill development. Its mission is to provide domain-specific skills and promote holistic development, particularly among individuals facing economic challenges. The program prioritizes the training of marginalized groups, including girls, economically disadvantaged individuals, and SCs/STs. The total number of youth enrolled is indicated below in Figure 10; it also specifies the total number of SC/ST youth enrolled in the program.

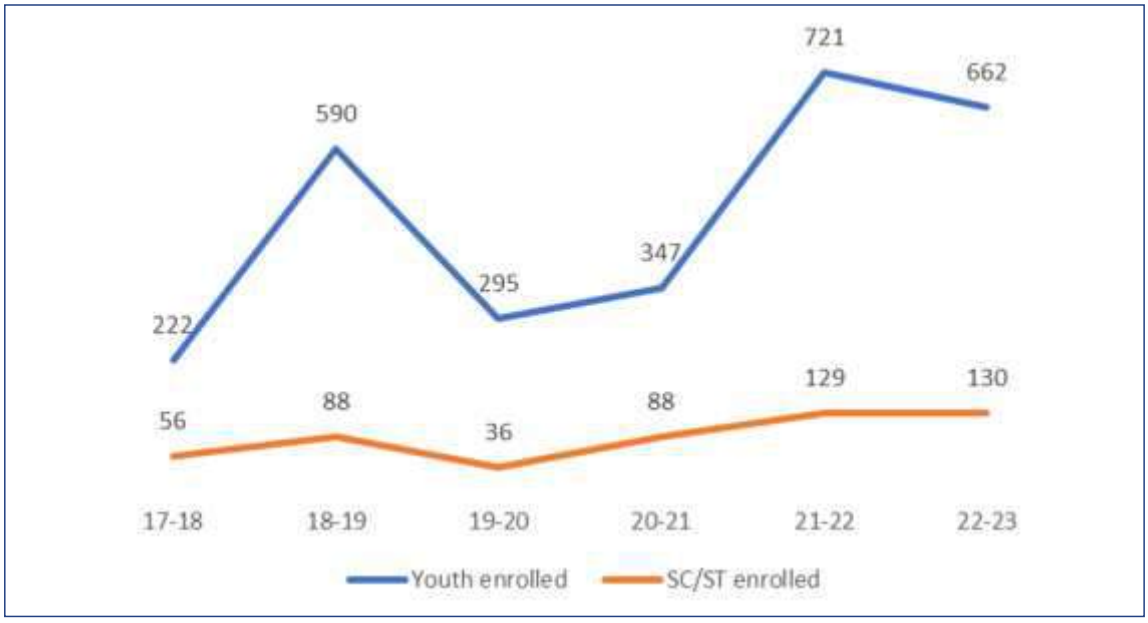

Figure 8: Total number of youth enrolled in the Youth development module from FY 2017 to FY 2023

The Tata STRIVE Youth Development Module (YDM) was a multifaceted program incorporating instructor-led online learning, hands-on lab work, classroom sessions facilitated by trained instructors, and self-paced modules. This approach catered to both IT-related domains, encompassing theoretical and practical aspects and essential life skills required for the workplace. During the COVID-19 pandemic, a blended learning methodology was employed to deliver technical courses.

Through their partnership with TCIT, TCSRD implemented industry-specific skill development programs in Uttar Pradesh, targeting youth from socially and economically disadvantaged backgrounds. The Youth YDM equipped individuals with the skills and knowledge necessary for employment or entrepreneurship. TCSRD developed the Youth Development Scorecard (YDSC) App to track progress and outcomes as part of this collaboration. Following the training, youth were successfully placed with the assistance of the Tata Strive center. In 2021-22, 498 youths underwent training, of which 362 (72.6%) were successfully placed. Among these placements, 46 youth belonged to the SC/ST/OBC categories. The average annual income of the trained youth is estimated to be around Rs 1,42,524, which had an upward yearly trajectory from 1.18 Lakhs in 17-18 to 1.42 Lakhs in 21-22. Further details regarding the total number of trained and placed youth, along with their annual income, are provided in Figures 9, 10 and 11.

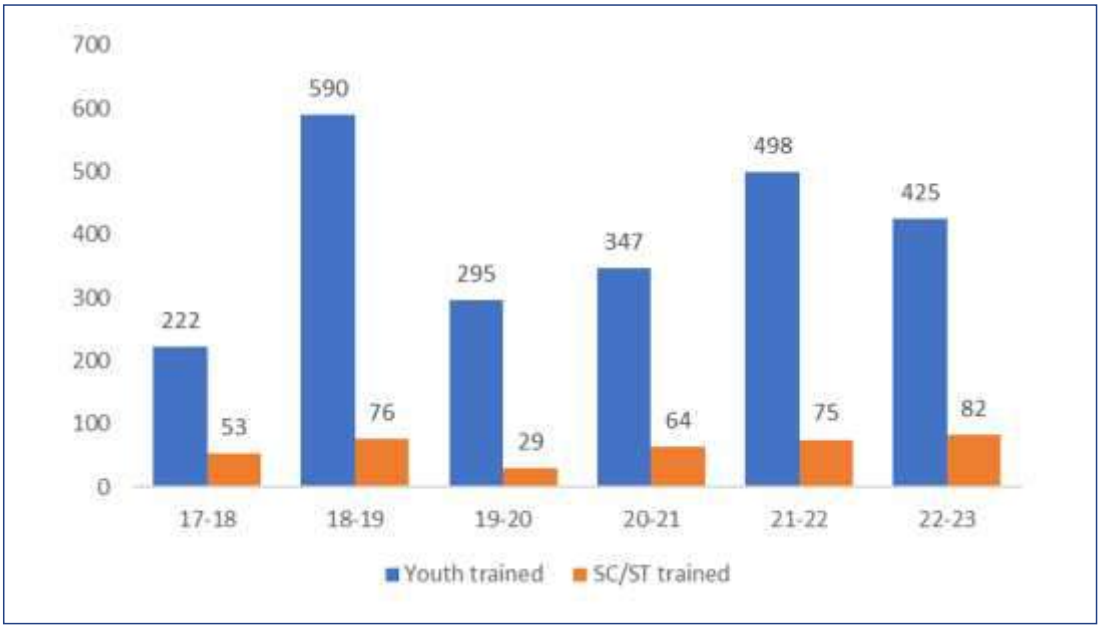

Figure 9: Total number of youth trained in the Youth development module from FY 2017 to FY 2023

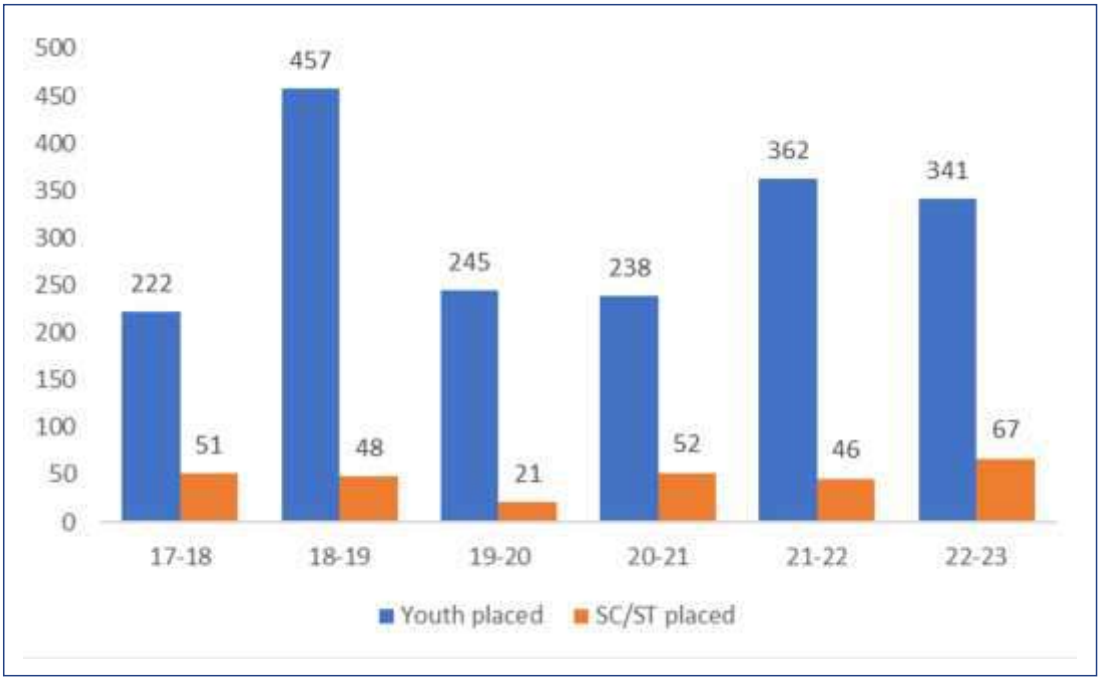

Figure 10: Total number of youth placed in the Youth development module from FY 2017 to FY 2023

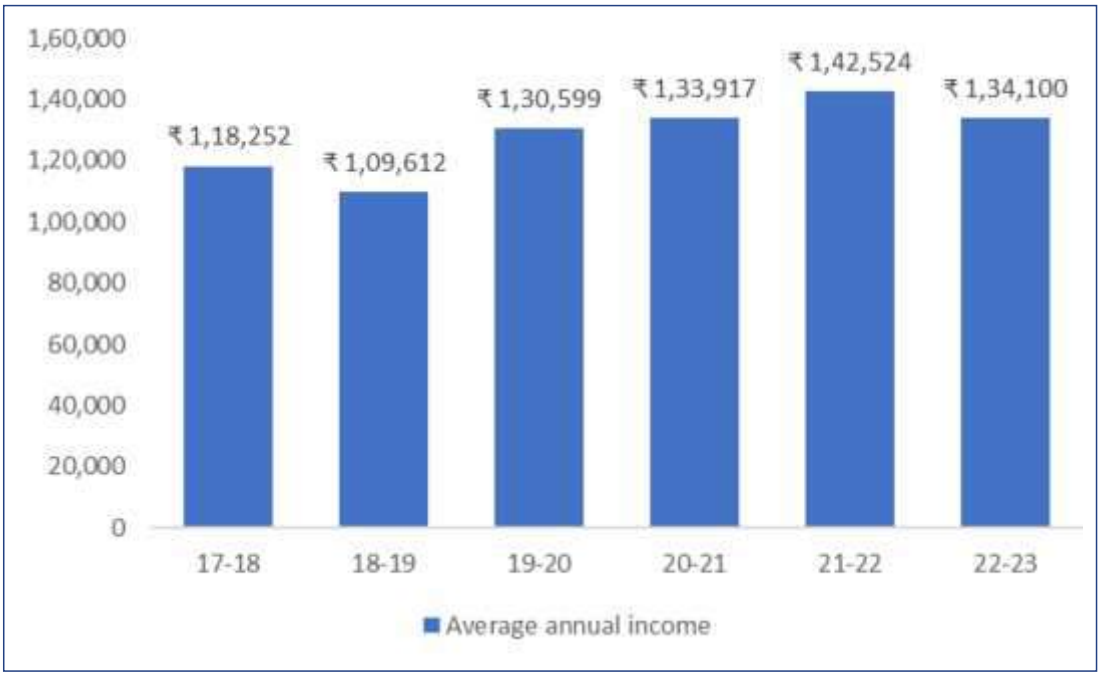

Figure 11: Average annual Income of per youth trained and placed from FY 2017 to FY 2023

The institute engaged in various activities, including establishing an Assistant Beauty Therapy (ABT) Lab with support from the L'Oréal Team, subject matter expert sessions from companies, interactive sessions with prospective employers, and graduation day celebrations. These initiatives collectively contributed to the overall empowerment and upliftment of underprivileged youth in the region.

Upon interacting with trainees from various courses, their parents, trainers, center managers, and the mobilizers, the study found that the Tata Strive program has had a significant impact on the lives of the youth, providing them with valuable skills and opportunities for employment and entrepreneurship. Through interviews with program participants, several key aspects emerged regarding the effectiveness and relevance of the program.

Awareness and Enrollment: Participants learned about the courses through various channels such as friends, online platforms, and referrals. The mobilization also involved engaging community members like ASHAs, gram panchayats, and officers with particularly effective job fairs. Enrollment procedures typically involved filling out admission forms and submitting necessary documents like Aadhar and PAN cards.

"One of my friends told me about the course, and I enrolled in 2021. The course is called BDE (Business Development Executive) and lasts six weeks. I pursued the course because Tata Strive assists with job placement." - BDE Student

Relevance of Courses: The courses offered, such as BFSI (Banking, Financial Services, and Insurance), AC&R (Air Conditioning & Refrigeration), and others, were chosen based on market demand and the personal interests of the participants. Participants found the courses relevant to their career aspirations, providing them with domain-specific skills and knowledge. The program also included life skills training alongside technical skills, aiming to boost employability and socio-economic status, with the goal of job placement and skill enhancement.

"The program was crucial for me as I was clueless about how to enter the banking sector. I didn't know about the training required or experience needed to secure a job in that field." - BFSI Student 1.

Learning Experience: The program had a well-equipped infrastructure comprising classrooms, laboratories, and practical training facilities. It offered a balanced blend of theoretical knowledge and hands-on skills. Trainers utilized a variety of teaching approaches, such as classroom lectures, online modules, practical demonstrations, and field trips. Notably, on-the-job training emerged as the most effective method. Regular interactions and feedback channels addressed challenges like maintaining discipline and attendance.

Furthermore, the program collaborated with government initiatives to promote skill development and raise awareness about entrepreneurship opportunities. Participants gained crucial competencies, including communication, customer service, and technical proficiency, that were relevant to their chosen fields. The program also facilitated campus placements by establishing connections with employers, and informal feedback mechanisms were in place to support trainees throughout their journey.

Impact on Employability: After completing the courses, numerous participants secured positions in esteemed organizations such as Axis Bank, HDFC Bank, and ICICI Bank. The program played a pivotal role in boosting participants' confidence, refining their communication abilities, and bolstering their employability. Additionally, several participants capitalized on the skills acquired during the training by launching their businesses.

"It was incredibly influential in providing employment opportunities. After completing the course, I was offered multiple jobs, regular feedback was collected from the Tata Strive call center, and the infrastructure was adequate." - BFSI Student 2.

Feedback and Support: Participants benefited from the trainer's feedback and the Tata Strive call center concerning their progress and job placements. This feedback loop was instrumental in refining training sessions and resolving any challenges encountered by the participants. The program ensured a supportive learning environment by offering ample infrastructure and assistance.

"The teacher trained us to learn how to behave during interviews and how to dress appropriately. Both online and offline classes were conducted, which helped us clear our doubts." - Solar Student.

Sustainability and Future Opportunities: The training program offered immediate job prospects and laid the foundation for sustained career advancement and financial security. Participants were content with how the program landed them jobs and uplifted their livelihoods. To maximize its impact, introducing more advanced training initiatives and boosting awareness to attract a wider audience is crucial for fostering skill development. Moreover, enhancing placement opportunities and extending follow-up periods would further strengthen the program's effectiveness and ongoing support for participants.

Tata Strive program has played a crucial role in empowering youth from marginalized backgrounds by equipping them with relevant skills, fostering employment opportunities, and promoting entrepreneurship. The program has made a significant difference in the participants ' lives through practical training methodologies, personalized support, and continuous feedback mechanisms, enabling them to achieve their career aspirations and contribute to economic growth.

3.1.4 TCS - Youth Employment Programme:

To enhance the employability of marginalized youth in Mambattu and Cuddalore, TCSRD, in collaboration with the TCS Youth Employment Programme (YEP), introduced a skill development initiative in the region. The program specifically targeted individuals from the SC/ST and economically weaker sections of society who had either been pursuing education or had completed their studies but were unemployed.

At the Mambattu Center, the program emphasized developing soft skills, aptitude, and industry-ready skills. In the program's first year 2020-21, only ten students enrolled, which gradually increased to 190 students by 2022-23, as indicated in Figure 12. Among these students, 142 belong to the SC/ST category.

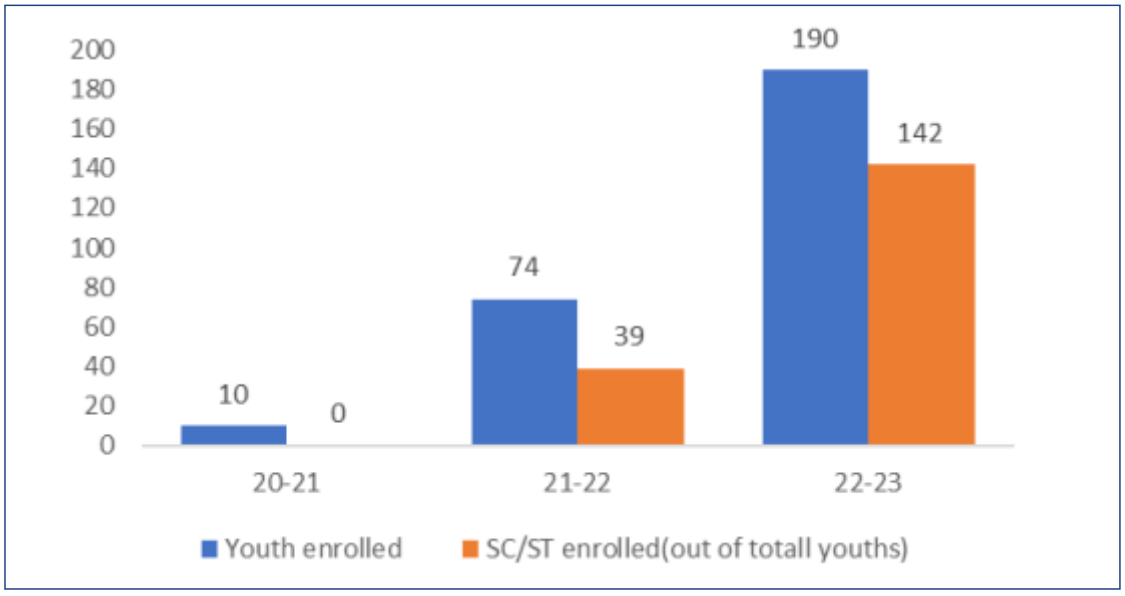

Figure 12: Total number of youth enrolled in Mambattu center during FY 2020 and FY 2023

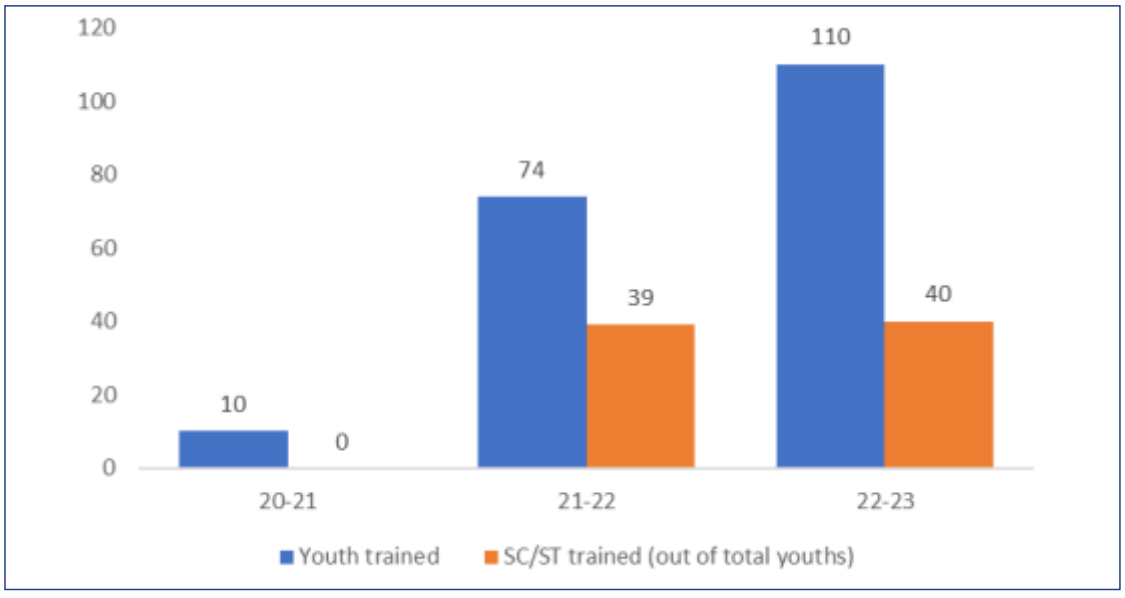

Figure 13: Total number of youth trained in Mambattu center during FY 2020 and FY 2023

After completing the training, the youth were equipped with essential skills and informed about job opportunities within TCS and other companies across various sectors. In 2021-22, only three individuals secured employment, with an average annual income of Rs 180,000.

Meanwhile, Cuddalore participants received soft skills training alongside support to prepare for government exams. From 2020 to 2021, approximately 110 youths enrolled in the Cuddalore center, with 40 belonging to the SC and ST categories (refer to Figure 14). Out of the trained youth, only ten individuals were placed and earned an average annual income of Rs 1,20,000.

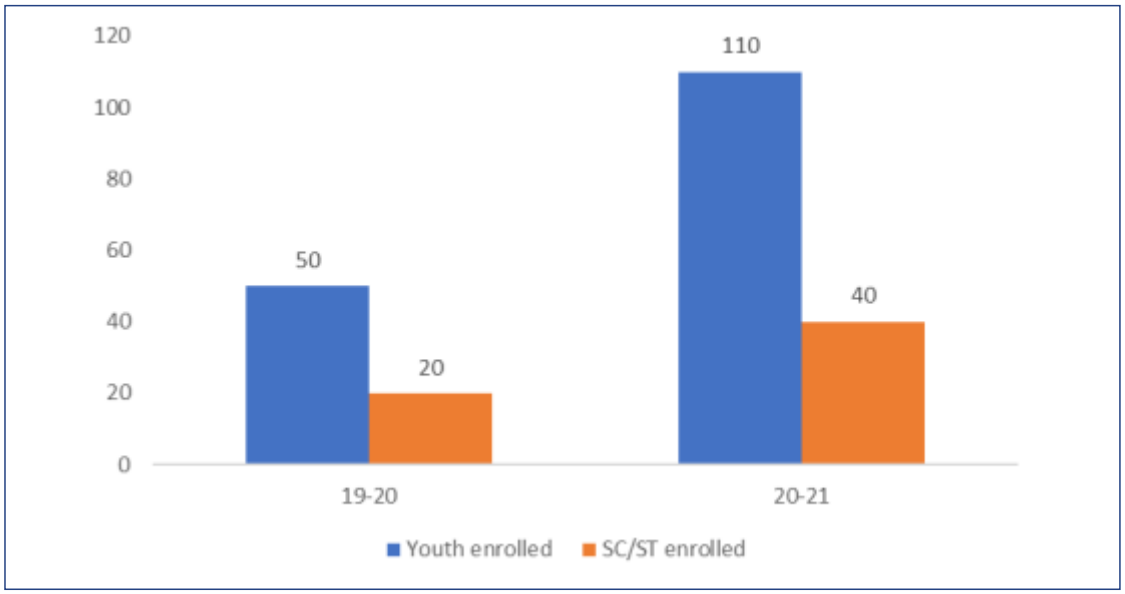

Figure 14: Total number of youth enrolled in Cuddalore center during FY 2019 and FY 2020

The collaborative effort continued to empower marginalized youth by providing them with valuable skills and guidance to navigate the job market successfully even after 2021 in the academic year 21-22 and 22-23, however the details of training numbers and students were not readily available to represent.

The testimonies from the youth in Cuddalore and Mambattu shed light on the impact of skill development programs on their lives and livelihood opportunities.

Cuddalore Youth :

The educational landscape in Cuddalore is heavily skewed towards IT-related jobs, primarily driven by the intense competition and limited opportunities in other sectors. Many students, regardless of their majors, are drawn to the allure of IT positions, hoping to secure lucrative placements in this field.

"Currently, most college students focus on studying IT and are interested in doing IT-related jobs. Even those who study other majors also choose IT jobs, so getting placed is heavy competition and challenging." - Youth 1, Cuddalore.

To address the pressing need for skill development and employment opportunities, the TCL Skill Development Program emerged as a hope for the youth in Cuddalore. The program's inception was marked by proactive efforts from department staff to spread awareness among students, encouraging them to enroll and acquire skills essential for coveted positions in renowned companies like TCS.

The relevance of the TCL Skill Development Program became evident as it filled critical gaps in employable skill development, particularly in areas like communication and soft skills. The program presented a pathway to success for many participants, especially those lacking practical communication abilities, offering the necessary tools for navigating the competitive landscape and securing placements in prestigious MNCs.

"The project benefited me as it allowed me to learn about aptitude and work-related abilities, including soft skills and communication skills. Government colleges currently do not offer any courses on developing employable skills. Therefore, it was advantageous for many students, especially those in government colleges. The program is essential for students who struggle with communication and has significantly contributed to their professional and personal development. Young people, especially those aspiring to work in IT, can greatly benefit from it." - Youth 2, Cuddalore.

Implemented with care, the program effectively imparts diverse skills essential for professional growth. Through engaging methods such as PowerPoint presentations, activities, and interactive sessions, participants gained proficiency in communication, aptitude, and professional etiquette, equipping them with the tools needed to excel in today's job market.

The impact of the TCL Skill Development Program was palpable, with participants experiencing tangible improvements in communication and interview skills. While some successfully secured jobs, others expressed confidence in their ability to leverage their enhanced skill set for post-graduation opportunities, underscoring the program's significance in shaping their career trajectories.

"I got selected in TCS through this training and placement drive. Additionally, I received job offers by clearing the entry-level aptitude tests. Feedback was provided through online sheets. The training program was effective and helped me get employed while improving my skills. The infrastructure facilities were adequate, and since the training was provided on the college campus, it was convenient for me." - Youth 3, Cuddalore.

Looking toward sustainability, participants lauded the trainer's approach and encouragement as the program's standout feature. However, suggestions for improvement included extending the course duration to facilitate deeper learning and skill acquisition, ensuring that participants are thoroughly equipped to meet the evolving demands of the job market.

Mambattu Youth:

The youth in Mambattu present a diverse educational background, yet many need help securing jobs relevant to their qualifications. Despite their varied majors and degrees, finding suitable employment opportunities aligned with their skills and aspirations was the prevailing challenge.

The TCL Skill Development Program emerged as a choice in response to the pressing need for skill enhancement and job prospects. Individuals enrolled in the program to acquire essential skills that could lead to better job opportunities. Often, they were referred by friends or informed about the program through their colleges, recognizing it as a valuable opportunity to enhance their employability.

The relevance of the TCL Skill Development Program cannot be overstated, particularly in its ability to address immediate job prospects, especially in coveted MNCs. Participants viewed the program as instrumental in bridging the gap between their existing skills and the job market requirements, offering a pathway to secure employment in prestigious organizations.

"I have achieved financial independence and can explore more opportunities in other companies too. The training has improved my English and communication skills, as well as my interview skills and resume-building abilities. It has been helpful as it taught arithmetic, reasoning skills, and interview techniques, among other things." - Youth 1, Mambattu.

The effectiveness of the program's implementation was evident in the diverse range of skills participants acquired, including communication, reasoning, and interview preparation. Trainers adopted interactive teaching methods, fostering active participation and engagement among participants, thus ensuring effective knowledge transfer and skill development.

Despite the program's commendable efforts, the outcomes for participants were mixed. While some successfully secured jobs and embarked on promising career paths, others encountered challenges due to personal reasons or external circumstances. Nevertheless, the program's impact on the overall employability landscape in Mambattu remained significant.

"I believe the program should prioritize immediate placements for the candidates and include more courses tailored for job placements. It should be highly job-oriented, ensuring participants are well-prepared for the workforce." - Youth 2, Mambattu.

Looking towards sustainability, there were suggestions for improvement to enhance the program's effectiveness further. These included focusing on immediate job placements and adding more job-oriented courses to cater to the evolving demands of the job market. By incorporating such feedback, the program can continue to serve as a valuable resource for youth seeking to enhance their employability and secure meaningful employment opportunities.

The skill development programs have been instrumental in equipping youth with essential skills for employment opportunities. However, there are areas for improvement, such as extending course duration and enhancing job-oriented training. The testimonials reflect the diverse experiences and aspirations of the youth, highlighting the successes and challenges they face in their journey toward securing meaningful employment.

3.2. Analysis

Parameters	Description
Relevance	• With more than 66% of India's population below 35 years of age and 65-70% staying in rural India, creating a skilled workforce through vocational training is essential for the nation's growth and societal well-being, especially in places with a high chance of migration, and high dependency on agriculture. Thus, the interventions targeted towards the youth employment generation are relevant in India.
Effectiveness	• The project has successfully achieved its goal of equipping youth across different regions with employable skills and facilitating their placement in various job opportunities. Nationally, completing a placement rate of 60-70%+ per cohort is considered a significant measure of success, and the skilling projects undertaken by TCSRD have consistently met this benchmark. However, there remains room for improvement in the quality of jobs provided. Respondents have highlighted the desire for higher salaries commensurate with their educational qualifications and the need for relocation to newer cities.
Efficiency	• During the COVID-19 pandemic, skilling activities shifted to hybrid and online training modes, which continued smoothly despite challenges. Student feedback indicated that offline and online training sessions were conducted effectively and punctually. However, students desired enhanced placement opportunities and longer course durations to deepen their skill sets. To enhance project efficiency, interventions can focus on improving job placement outcomes, particularly regarding salaries.
Coherence	• The project partnered with NABARD, TTI, TCS, TCTI, and other esteemed organizations to facilitate high-quality training. Additionally, collaborations with MNCs were established to create job opportunities. The activities carried out were aligned with the specific job market needs of Tata Chemical factories in the region. Moreover, the project aimed to equip individuals with employable skills for the chemical industry and other sectors such as IT, manufacturing, hospitality, and more. • The project addressed SDG 1, 4, 5, 8, 9, and 10, focusing on providing quality education, decent work, and economic

	growth to the rural youth.
Impact	• In the four skilling initiatives, nearly three-quarters of enrolled students secured job placements, with salaries ranging from 6,000/month (SAKSHAM) to 15,000/month (TCS YEP), enabling them to make economic contributions to their families and communities. Furthermore, besides employment, these initiatives facilitated enhancements in communication, confidence, and other personal growth skills.
Sustainability	• The projects aimed to offer comprehensive opportunities for youth development, addressing evolving skill demands and essential personal competencies. However, feedback from youth highlighted the desire for extended course durations and more job-oriented training to access better employment prospects with improved pay scales. Consequently, updating the curriculum to align with local and global skill demands could enhance project sustainability.

3.3. Practices Worked Well & Not Working Well

Project	Activity	Worked Well	Can Be Improved
Technical Training Institute in Mithapur	Mobilization		The project can cover more villages through mobilization to improve the student intake.
	Skill training	Up-to-date skill training to meet the Industry standards.	
	Placement	The center aids trained candidates in securing employment, with many placed in Tata group companies.	
Tata Strive	Mobilization	The mobilization strategy	

		encompasses all nearby areas, significantly enhancing the outreach efforts.	
	Placement	The center helps trained candidates find employment through its placement services and supports those interested in starting their own businesses.	
	Post training follow-up	The center has established and maintained a strong relationship with its alumni network, allowing it to stay connected with former students and expand its network of employers effectively.	
Mambattu	Mobilization	The mobilization strategy encompasses all nearby villages, significantly enhancing the outreach efforts.	
	Skill training program		The online training program has been successful, but its effectiveness could be improved by integrating blended learning modules or in-person training sessions for a more comprehensive learning experience.
Cuddalore	Mobilization	The mobilization strategy encompasses all nearby	Separate dedicated team for mobilization

		government colleges, significantly enhancing the outreach efforts.	constitutes a crucial improvement in their mobilization process.
	Skill training program	The soft skills training program has helped young people clear job interviews and secure employment. Additionally, it helped them prepare for government exams.	

Table 3: Outcome achievement matrix - Skill Development Programs

3.4. Recommendations

Technical Training Institute in Mithapur

1. Enhancement of Mobilization Strategies: To increase outreach and coverage of the Technical Training Institute in Mithapur, a dedicated mobilization team or mobilizer should be appointed. Currently, the institute relies on existing staff members to conduct mobilization efforts, primarily through platforms like panchayat and SHG meetings. A separate mobilization team would expand coverage to more villages and effectively reach target groups.

2. Improving Transportation Facilities: The need for more local transportation poses a challenge for youth, particularly girls, in attending training programs. Providing transportation facilities through the training institute would alleviate this barrier and ensure better attendance, especially in areas with limited public transportation options.

3. Support for Aspiring Entrepreneurs: Many youth express interest in entrepreneurship but need help with financial constraints and limited access to credit facilities. Offering handholding support to aspiring entrepreneurs, including assistance in accessing bank credit and government schemes, can empower them to start their businesses and pursue their entrepreneurial aspirations.

4. Development Rural Incubation centre at TTI: The Technical Training Institute in Mithapur has a large and well-equipped facility. They can use this center to create a rural incubation center where candidates can get support for their innovative ideas. This center can specialize in courses related to agro-processing technology.

5. Structured Feedback Mechanism: Implementing a structured feedback mechanism is crucial for enabling effective communication between youth and the institution. Currently, feedback is primarily provided verbally during classes, but formalizing the process with written documentation and systematic recording will ensure that all input is captured and can inform improvements in various aspects of the training programs.

TCS Youth Employment Programme:

1. Separate team for Mobilization process:
There is a requirement for a dedicated team solely focused on the mobilization process in Cuddalore. This will enhance their outreach and mobilisation capabilities. Currently, only one team member is engaged in the mobilization process, which poses challenges in executing the activities effectively.

2. Counselling Services: Establishing a structured counselling process for youth in Mambattu and Cuddalore is essential for better understanding their interests and needs. Counseling sessions will enable the training teams to tailor courses and programs accordingly, reducing dropout rates and helping youth make informed decisions about their educational and career paths.

3. Mode of Training Improvement: In Mambattu, where training is currently conducted online, there is a need to enhance the training mode by introducing in-person training programs for youth. This approach will provide a more interactive and engaging learning experience, improving the effectiveness of the training initiatives.

4. Feedback Mechanism Implementation: Like Mithapur, implementing a structured feedback mechanism in Mambattu fosters open communication between youth and the training team. Regular feedback sessions will allow the team to identify areas for improvement and make necessary adjustments to meet the needs and expectations of the participants.

Section 4 : Drinking Water & Sanitation

The primary focus of Drinking Water & Sanitation initiatives was on ensuring access to clean and safe drinking water, alongside implementing sanitation solutions for the community in Okhamandal villages (Mithapur region). TCSRD implemented projects independently, and in collaboration with the state government to tackle the challenges related to drinking water and sanitation. These initiatives encompassed a range of interventions aimed at improving water quality, increasing access to potable water sources, and promoting sanitation practices within the community.

4.1. Roof Rainwater Harvesting Structures

The implementation of Rainwater Harvesting Structures stood out, specifically targeting households located away from the main village, where collecting drinking water posed difficulties. These structures enabled the storage of rainwater throughout the year. It involved contributions from both TCSRD and the beneficiaries. Within the assessment period of 20-21 to 22-23, over 105 families benefited with the roof rainwater harvesting structures.

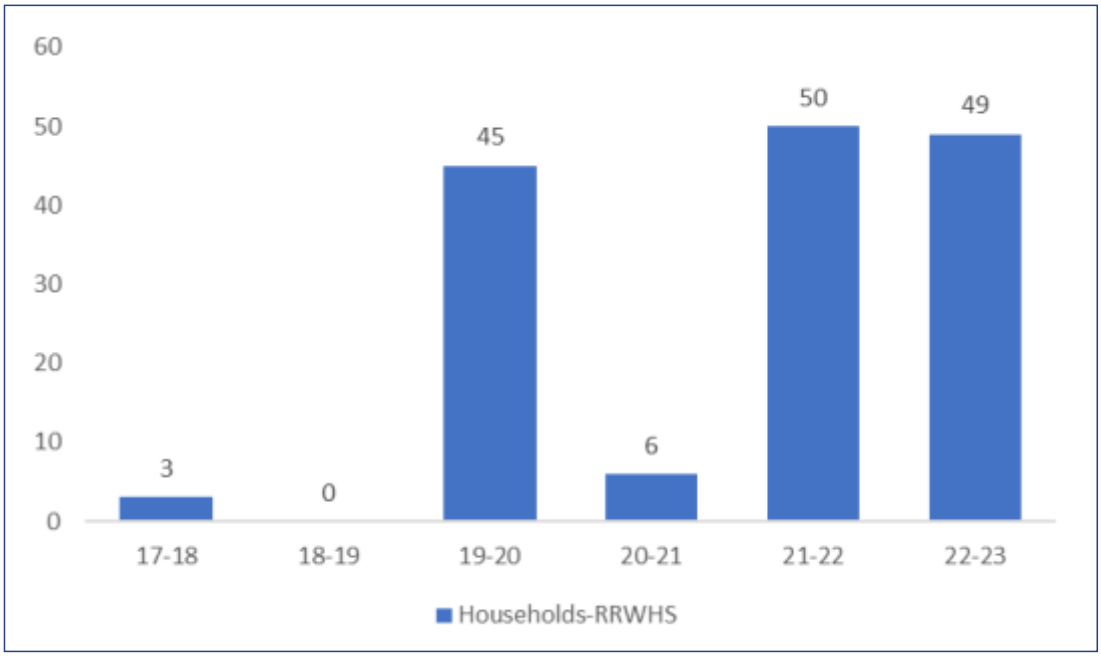

Figure 15: Total number of households with RRWHS from FY 2017 to FY 2023

During interactions with the beneficiaries of the RRWHS project, it became apparent that prior to its implementation, accessing clean drinking water posed a significant challenge for numerous households. For instance, a farmer from Chandrabaga village recounted the

arduous process of fetching water from a distant lake, which occupied a considerable amount of time each day. Likewise, residents of other villages like Samlasar Wadi Vistar, Samlasar, and Mojap also encountered obstacles in obtaining clean water due to their remote settings and absence of piped water infrastructure.

Rainwater harvesting tanks were constructed in the villages, providing a reliable source of clean drinking water throughout the year. Another farmer highlighted the convenience and effectiveness of the system, emphasizing the reduction in physical burden and cost associated with water transportation. Moreover, the quality of drinking water improved significantly, leading to better health outcomes for the community members.

"The RRWHS project has made a huge difference in our community's daily life. Before it, so much of our women's time was spent fetching water, leaving little room for anything else. But now, thanks to the project, many women have more time to dedicate to other activities, like agriculture. This shift has had a noticeable impact on our agricultural production, all for the better." - FGD with Samlasar-Wadi Vistar villagers.

The project's relevance to the specific water needs of the villages is evident, with participants acknowledging its crucial role in addressing water scarcity, especially for farming households situated away from urban centers. The effectiveness of RRWHS in improving access to clean water is underscored by the community's satisfaction with the system's performance. Rainwater harvesting tanks, constructed with TCSRD's support, have proven to be durable and efficient in storing rainwater for domestic use.

"Thanks to the project, we've had rainwater harvesting tanks built in our village, and it's made a significant difference in our drinking water situation. The best part? We don't need to do any special processing before drinking the rainwater. It's safe and ready to use straight away. With this system, we can rely on having clean water available all year round without any hassle." - FGD with villagers, Chandrabaga.

The villagers expressed challenges such as high excavation costs and logistical issues during installation. However, these challenges did not overshadow the positive impacts of RRWHS on the communities. Farmers suggested that increasing the financial assistance provided by TCSRD for tank construction could further enhance the project's sustainability, considering inflation over time.

In terms of sustainability, measures such as regular cleaning and maintenance of the water tanks have been implemented to ensure the long-term functionality of RRWHS. TCSRD's engagement with the community through financial assistance and monitoring visits has facilitated ongoing maintenance and effective utilization of the system.

"We make sure to clean the water tank regularly, and we store all the RRWHS tools in the right place throughout the year. Before the monsoon season, we conduct a thorough cleaning of the tank and keep all the materials, like pipes, safely stored for use during the rainy season." - FGD with Samlasar Villagers.

In summary, the RRWHS project has significantly improved the lives of villagers by granting them access to clean and safe drinking water, alleviating the burden of water collection, and enhancing agricultural productivity. One notable recommendation for enhancing the project, as suggested by the farmers, is to increase financial assistance for construction of RRWHS.

4.2. Swachh Tarang

The Swachh Tarang initiative, which was launched in 2019 in collaboration with the Ncourage Social Enterprise Foundation, aimed to improve access to safe and clean drinking water for underprivileged communities. Under the project over 49 awareness programs on drinking water and good practices were carried out in the villages of Mithapur region between 2020-23.

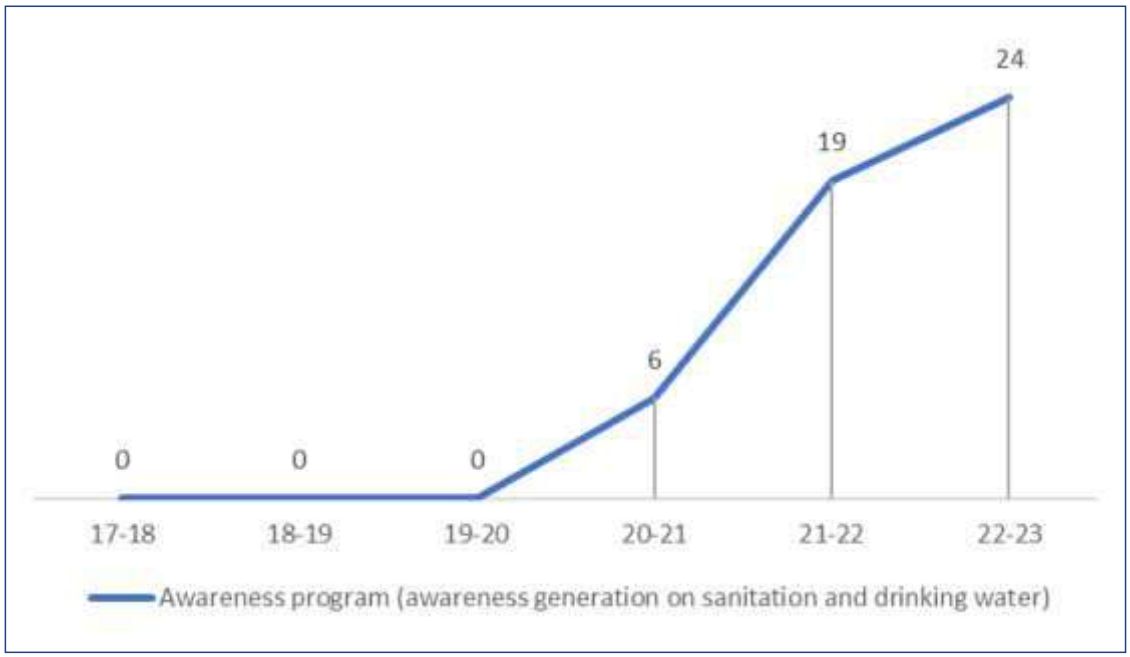

Figure 16: Total number of awareness program conducted from FY 2017 to FY 2023

The Swachh Tarang initiative, an innovative program conducted by TCSRD nationwide, focuses on installing community purifier units known as Tata Swach Tech Jal purifiers. These purifiers utilize innovative and sustainable water purification technology to provide communities with affordable drinking water. However, in the Mithapur region, only awareness sessions on safe drinking water were conducted, and the study couldn't interview the participants of these awareness sessions to assess the impact independently.

4.3. WASMO Project

WASMO, the Water and Sanitation Management Organisation, is a government initiative in Gujarat aimed at improving access to drinking water supplies in rural areas. Implemented across 18+ villages in the Okhamandal taluka, the project involved installing household tap water connections, RO plants, borewells, and drinking water wells. From fiscal years 2017-18 to 2022-23, a total of 1432 households were provided with household tap connections. (Figure 17)

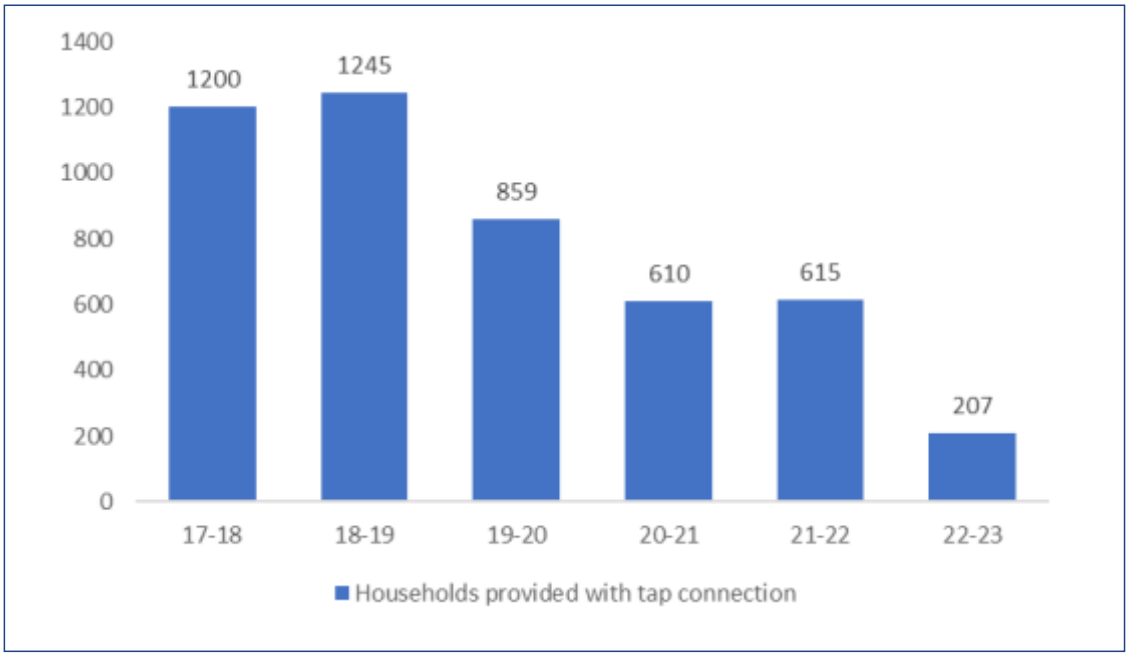

Figure 17: Total number of households provided with tap connection from FY 2017 to FY 2023

Moreover, TCSRD played a vital role in community development by building various structures such as RO plants, Drinking Water Wells (both constructed and renovated), pumping machinery, borewells, and pump rooms in the villages. Specifically, in the fiscal years 2020-21 to 2022-23, TCSRD completed the construction of 43 such structures in the villages (refer to Figure 18).

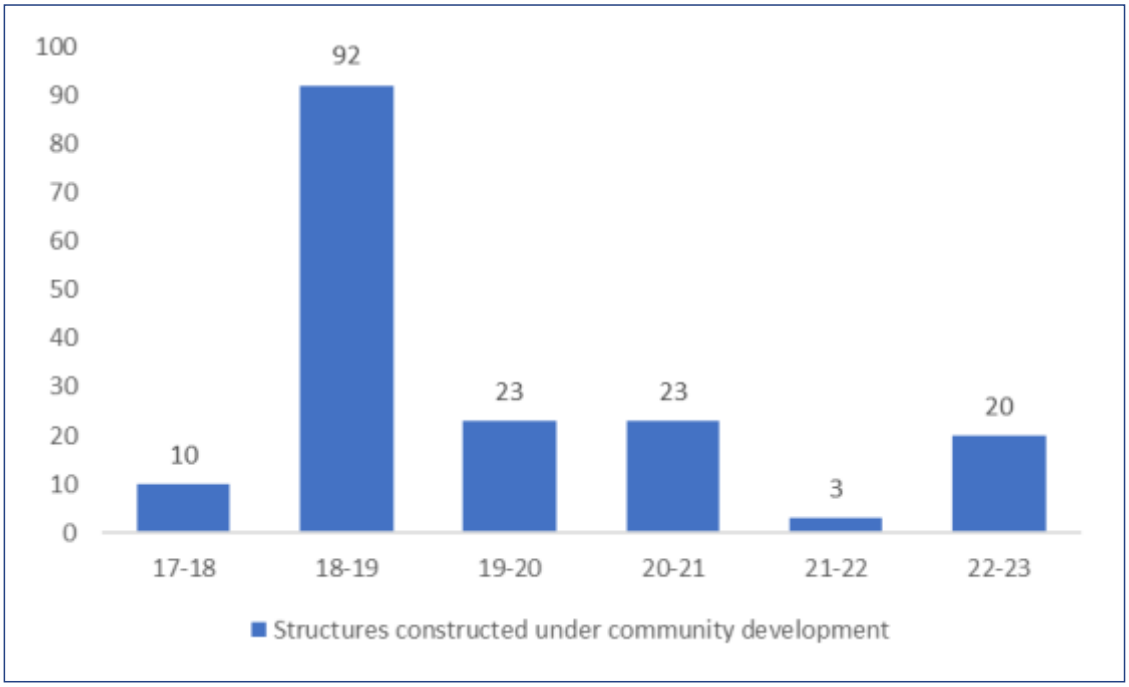

Figure 18: Total number of Structures constructed under community development from FY 2017 to FY 2023

Recognizing the importance of community involvement, a "pani samiti," a community-based organization, was established. Selected members from the community were tasked with overseeing the maintenance and monitoring of the WASMO project, highlighting the significance of community participation. Capacity building for this pani samiti was conducted through a series of meetings, exposure visits, and training sessions. Training sessions focused on testing water quality, bookkeeping, technical and administrative skills, as well as various social aspects.

The study conducted interviews with residents of Chandrabaga village, where the WASMO project was implemented. Villagers noted that before the intervention, accessing drinking water was challenging. However, with TCSRD's assistance, rainwater harvesting tanks were installed, along with pipeline connections from a nearby lake. This significantly improved water quality and accessibility for the community. Additionally, TCSRD supported the construction of toilets and facilitated the transfer of water from the village pond to households through pipelines.

"TCSRD and the WASMO project have accomplished significant work in our village. They constructed rainwater harvesting tanks, providing us with accessible drinking water sources. Additionally, TCSRD supported the construction of toilets by contributing Rs 3000 per toilet. Moreover, they contributed Rs 125000 to bring water from the village pond to our community through pipelines." - FGD with Chandrabaga Villagers.

Community engagement played a vital role throughout the project. TCSRD and WASMO organized meetings where villagers contributed financially and participated actively in decision-making processes. As a result, around 70 to 80 households directly benefited from these interventions, leading to enhanced village facilities and an increase in the number of toilets.

"Eighty percent of the village residents, including myself, participated in the project. We convened a meeting where villagers collectively contributed 10% of the total project cost. Additionally, it was agreed upon that each household would pay Rs 150 per month for the maintenance of tap connections in the village." - Villager, Chandrabaga.

TCSRD has taken responsibility for maintaining these interventions, ensuring their sustainability. Villagers commend TCSRD for its inclusive approach and effective implementation, particularly emphasizing the significance of rainwater harvesting tanks. However, there are suggestions for improvement, especially concerning water quality. Some villagers have raised concerns about occasional discoloration of the water supplied, indicating the need for further purification measures.

4.4. Sanitation Projects

TCSRD, in partnership with the Government of Gujarat, played a significant role in implementing the Swachh Bharat Abhiyan Mission in the Okhamandal Taluka. Their collaborative efforts focused on assisting communities in constructing household toilets, thus contributing to enhancing sanitation infrastructure overall. Additionally, TCSRD also promoted good sanitation practices by organizing community awareness programs. These initiatives fostered a culture of cleanliness and hygiene within the community, in line with the objectives of the Swachh Bharat Abhiyan Mission.

During this collaboration, a total of 154 toilets were constructed between fiscal years 2020-21 and 2021-22. It's worth mentioning that no sanitation projects were undertaken in the area during fiscal year 2022-23. As the majority of villages were officially declared Open Defecation Free (ODF) by the state government.

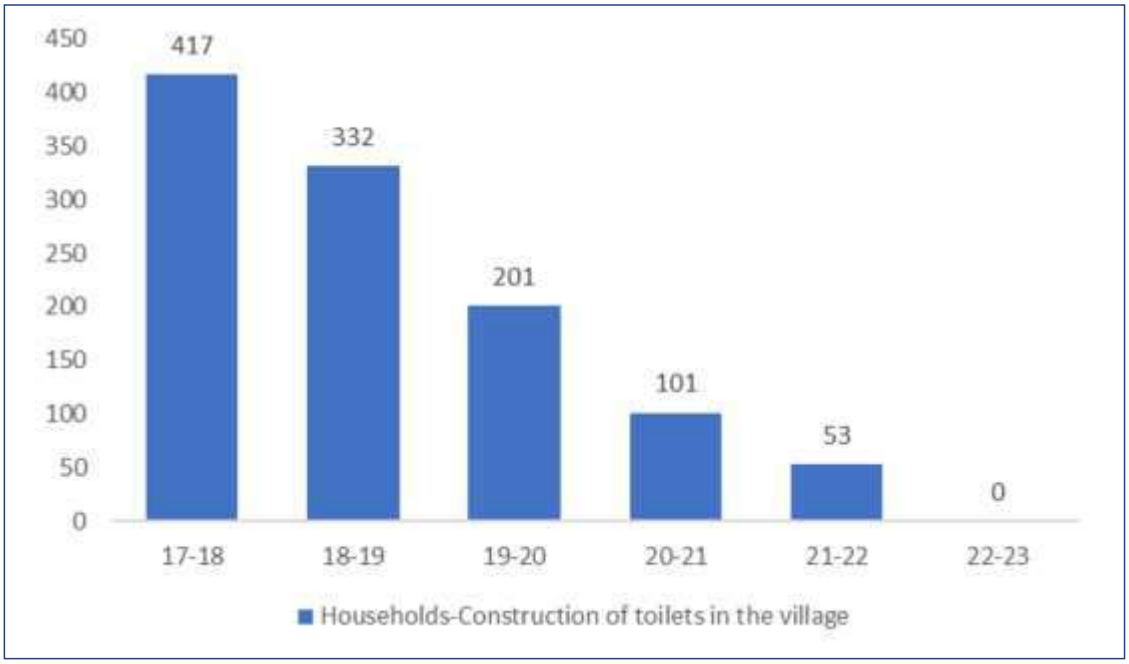

Figure 19: Total number of households constructed toilets from FY 2017 to FY 2023

Since there were no interventions in the project during the fiscal year 2022-2023, no interactions occurred with the beneficiaries. Therefore, the study cannot comment on the impact of the interventions during that period.

4.5 Analysis

Themes	Analysis
Relevance	• Access to clean drinking water and effective sanitation initiatives play a crucial role in ensuring the well-being and health of communities. With a focus on improving public health outcomes, these facilities and initiatives are paramount for combating waterborne diseases and promoting overall hygiene. In rural areas where access to clean water sources are limited, the provision of safe drinking water facilities becomes essential to prevent the spread of waterborne illnesses. Additionally, sanitation initiatives such as the construction of toilets contribute significantly to reducing the risk of contamination and disease transmission. By addressing these fundamental needs, drinking water facilities and sanitation initiatives not only improve the

	quality of life but also foster sustainable development within the communities of the Okhamandal block, promoting health, dignity, and social equity.
Effectiveness	• The Drinking Water and Sanitation initiative was to enhance drinking water and sanitation facilities in Okhamandal's villages. It involved constructing various infrastructure like drinking wells, borewells, pump rooms, RO Plants, and providing piped connections to households. Additionally, it included initiatives such as installing Roof Rainwater Harvesting systems, building toilets, and raising awareness about safe drinking water practices. Through these efforts, the project successfully provided year-round safe drinking water to over 1432 households via piped connections, supported 105 families with Roof Rainwater Harvesting systems, and facilitated toilet construction for 154 families. Consequently, these interventions contributed to the villages achieving open defecation-free status.
Efficiency	• The Drinking Water and Sanitation initiative extended to over 80% of the population across 18+ villages in Okhamandal, requiring an investment of 612 lakh Indian rupees. This investment facilitated year-round water access, significantly reducing the burden on women by saving time and minimizing human effort. By efficiently utilizing the project budget and leveraging contributions from villagers for installation and maintenance, financial resources were managed prudently. Moreover, the project established a community-based system called "Pani Samiti" to oversee water availability and maintain structures beyond the initial construction phase.
Coherence	• TCSRD partnered with the Government of Gujarat to establish water and sanitation facilities in villages as part of the Swachh Bharat Abhiyan and WASMO projects. Furthermore, the project collaborated with other NGOs to conduct awareness sessions and involved villagers in financial contributions and maintenance efforts for the construction of drinking water facilities. The project's contributions also aligned with various National and Sustainable Development Goals, including SDG 3, 4, 5, 6, 10, 11, 12, 13, 15, 16, and 17.
Impact	• The RRWHS project provide clean drinking water to over 105 families in remote areas throughout the year. Additionally, the WASMO project facilitated tap water connections for 1432 households by constructing 43 water structures across 18

	villages, ensuring daily water availability. Furthermore, the construction of 154 toilets and the delivery of awareness sessions on safe drinking water and sanitation processes have collectively enhanced the availability of clean drinking water, improved sanitation facilities, reduced human efforts, and enhanced the overall quality of life for villagers.
Sustainability	• The construction and utilization of these facilities saw significant community engagement and contribution. The introduction of the Pani Samiti further reinforced community ownership for distributing water facilities and ensuring regular maintenance. Overall, the project has demonstrated longevity due to the community's active involvement and consistent use of the facilities. Introducing additional filtration facilities to address occasional issues like yellow water can enhance the overall impact of these facilities.

Table 9: Analysis across REECIS parameters

4.6 Practices Worked Well & Not Working Well

Project	Activity/Practices	Worked well	Can be improved
Drinking Water	Doorstep access to tap connection	TCSRD has contributed to the development of piped connections, ensuring villages have access to safe drinking water.	
	Formation of Pani Samiti	The Pani Samiti, functioning as a village committee, was committed to overseeing and maintaining the water supply within their community. Through their efficient management, they successfully fulfilled their responsibilities in ensuring the smooth operation of the water supply system.	
	Construction of Roof Rainwater Harvesting Structure	TCSRD supported households with water access challenges by constructing roof rainwater harvesting structures. These	An alternative solution for RRHWS should be explored, as the current structure has sunk due to the low soil

		structures facilitated the collection and storage of rainwater for up to a year, providing a sustainable source of drinking water. Consequently, communities experienced improved access to toilets and actively utilized them.	retaining power.
	Collaboration with WASMO	This partnership united state government, TCSRD, and the local community to jointly address the availability and accessibility of drinking water in the region.	
Sanitation	Awareness of good sanitation practices	The communities in the villages were well-informed about sanitation practices. They actively used toilets, discontinuing open defecation, and were committed to maintaining good sanitation practices.	
	Collaboration with the government department	TCSRD assisted communities in applying for the Swachh Bharat Abhiyan Scheme for toilet construction. Upon acceptance of the application, toilets were built with contributions from the beneficiary, TCSRD, and the government.	

Table 10: Output Achievement Matrix of Drinking Water & Sanitation Projects

4.7 Recommendations

1. Maintenance of the old structure of RRWHS: To maintain the functionality of existing roof rainwater harvesting structures, implementing a maintenance plan is crucial. This plan should involve regular inspections to detect and fix any cracks, leaks, or blockages in pipes and storage tanks. Regular maintenance not only prolongs the system's lifespan but also enhances rainwater collection and storage efficiency.

2. Alternate solution for storage tank (ferrocement tank and on ground structure tank): To address the problem of sinking storage tanks caused by low soil retaining power, it's essential to explore alternative solutions. Ferrocement tanks provide a sturdy and lightweight option with a high strength-to-weight ratio.

Additionally, above-ground storage tanks offer a viable solution, avoiding the need for excavation and reducing the impact on soil properties. Assessing both ferrocement and above-ground tank options will ensure a more durable and lasting storage solution.

3. Regular monitoring for Drinking water & Sanitation: TCSRD can establish a monitoring program for drinking water and sanitation in the villages or extend responsibilities of Pani Samiti to undertake this responsibility. This program should include regular testing of water sources and inspections of sanitation facilities. By doing so, TCSRD can ensure clean water and proper sanitation for all residents. Moreover, it can proactively identify any issues faced by households and their adherence to good practices. This proactive approach enables TCSRD to address problems promptly and safeguard the health and well-being of the community.

5. Conclusion

Tata Chemicals Limited's CSR endeavors, in partnership with TCSRD and other collaborating NGOs, have significantly influenced education, skill development, health, drinking water, and sanitation facilities in villages across Gujarat, particularly in the Okhamandal block of Devbhumi Dwarka district, and Mambattu (Andhra Pradesh), Cuddalore (Tamil Nadu), and Aligarh (Uttar Pradesh). These efforts also extend to neighboring districts through educational initiatives. An outcomes assessment study conducted for projects from fiscal years 2020-21 to 2022-23 meticulously scrutinized the outcomes and results of initiatives implemented under the overarching theme of Enablers for Sustainable Development.

Within the Health initiative, the organization launched a mobile medical van to address healthcare gaps in 22 villages of the Okhamandal block. This van reached an average of 50,000 people between three years, offering crucial services like outpatient care, maternal and child health services, screenings, medical camps, and referrals to Mithapur PHC for hospital admissions. The project tackled challenges of geographical distance and limited healthcare facilities in villages through the mobile van. Anganwadi and asha workers played pivotal roles in mobilizing communities and raising awareness.

The Continuity and Quality of Education initiatives, under the Education sub-theme encompassed six targeted programs designed to achieve diverse educational goals. Tailored scholarship projects facilitated students' educational journey from the 9th grade onwards, extending to graduation and post-graduation studies to alleviate financial constraints. The LEP program established learning centers with village-level tutors known as Balmitras, addressing challenges faced by primary school children and resulting in improved attendance, learning abilities, and confidence. The CSPC program aimed to reduce dropout rates in Okhamandal villages by implementing measures such as setting up libraries, teacher training, and capacity-building activities to enhance teaching quality and student engagement. The LAMP program focused on improving learning outcomes through Learning Resource Centers, language skill development, and library provisions, fostering higher retention rates and community leadership. The VLC program bolstered rural students' education in the Mambattu and Cuddalore region through special tuition classes, leading to significant improvements in academic performance and confidence. Lastly, the WOW Bus program enhanced students' engagement and comprehension of science, math, and computer science through digital learning, cultivating interest and facilitating learning in challenging subjects. Across these projects the initiatives reached more than 71 thousand beneficiaries through capacity building, teacher training, special tuitions, digital classes, and scholarships.Regarding youth, they were trained in industry-

ready skill sets to secure employment in multinational companies, with a placement rate of 60-70% immediately after training.

Within the drinking water and sanitation sub-theme, the RRWHS project ensured clean drinking water for more than 105 families in remote areas throughout the year. Furthermore, the WASMO project facilitated tap water connections for 1432 households by constructing 43 water structures across 18 villages, ensuring consistent access to water daily. Additionally, the construction of 154 toilets and the provision of awareness sessions on safe drinking water and sanitation processes have collectively improved access to clean drinking water, upgraded sanitation facilities, minimized human efforts, and elevated the overall quality of life for villagers.

Across these three vital thematic areas, the organization has worked to address gaps in healthcare, sanitation, drinking water, skill development and education facilities, ultimately improving the lives of beneficiaries and the wider community. To further enhance its reach and impact, the project could focus on increasing awareness of available scholarships among parents and students, educating School Management Committee (SMC) members about all educational programs, providing additional training for teachers, improving communication and coordination among project teams, revising scholarship amounts to better meet students' financial needs, and addressing infrastructure gaps in education and healthcare facilities across villages. These efforts can help optimize the project's effectiveness and ensure maximum benefit for the communities served.

Building Social Capital

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LIST OF ACRONYMS

CBO	Community-Based Organisation
CSR	Corporate Social Responsibility
FGD	Focus Group Discussion
ILO	International Labour Organization
KII	Key Informant Interview
SHG	Self Help Groups
TCL	Tata Chemicals Limited
TCSRD	Tata Chemicals Society for Rural Development

1. INTORODUCTION

Rural women worldwide face significant challenges in achieving economic recognition and independence. One of the primary obstacles they encounter is the disparity in economic compensation for their labor compared to their male counterparts. Despite contributing substantially to agricultural production and other rural industries, women often receive lower wages or have limited access to resources and opportunities for economic advancement. According to reports by international development agencies such as the United Nations Development Programme (UNDP) and the World Bank, these disparities persist due to various factors, including gender discrimination, lack of access to education and training, and unequal distribution of resources within rural communities (UNDP, 2020; World Bank, 2019).

In addition to economic challenges, rural women face social barriers that undermine their status and societal influence. Their voices are frequently under-represented in decision-making processes, both at the household and community levels. Traditional gender norms and cultural practices often relegate women to subordinate roles, limiting their ability to assert themselves and participate actively in social and political spheres. Reports from organizations like the International Labour Organization (ILO) highlight the need to address these social inequalities to enable rural women to fully realize their potential and contribute to sustainable development (ILO, 2021).

Empowering rural women requires addressing the root causes of their economic marginalization and social disenfranchisement. Financial independence plays a crucial role in enhancing women's agency and autonomy. By providing women with access to credit, land ownership, and entrepreneurial opportunities, they can overcome economic barriers and assert greater control over their lives. Government initiatives such as the National Rural Livelihoods Mission (NRLM) in India aim to empower rural women through targeted interventions that promote economic self-sufficiency and social inclusion (Government of India, 2020).

To combat this, rural women face multifaceted challenges in achieving economic recognition and independence, including disparities in monetary compensation, social marginalization, and limited access to resources and opportunities. Empowering rural women requires addressing these challenges through comprehensive strategies that promote financial independence, address social inequalities, and leverage the collective strength of women through initiatives such as self-help groups. By investing in rural women's economic and social empowerment, societies can unlock their full potential as change agents and catalysts for sustainable development.

Collectivization of women through self-help groups (SHGs) has emerged as a powerful strategy for empowering rural women and fostering economic and social development. By coming

together in solidarity, women can pool their resources, share knowledge and skills, and advocate for their collective interests. Studies by organizations like the International Fund for Agricultural Development (IFAD) demonstrate the transformative impact of SHGs in enhancing women's economic status, improving their access to markets and services, and promoting gender equality within rural communities (IFAD, 2018).

1.1 Project Introduction

TCSRD acknowledges the transformative influence of social capital in empowering women and rejuvenating rural communities through nurturing robust relationships, teamwork, and a shared sense of purpose among community members. Central to this approach is the formation of Self-Help Groups (SHGs) and support for self-employment, fostering mutual assistance and collective initiatives. By championing gender equality and women's empowerment, TCSRD's initiatives generate a ripple effect that fortifies SHGs, promotes community involvement, stimulates business expansion, and ultimately enhances the well-being of rural households.

Below are the specific interventions under women's empowerment between the Financial year 2020-21 to 2022-23, implemented by TCSRD[17].

Theme	Interventions
Women Empowerment	**Self Help Groups** Activities to improve average income per SHG member, improvements in savings, inter-loaning, social security schemes, and Capacity-building training took place from 2020 to 23. **Self Employment and Enterprise Development** Inter-loan support, facilitating connections with banks for loans, sharing information about income-generating schemes, and establishing new small enterprises took place from 2020-23.

Table 1: Activities carried out under Women Empowerment project from FY20 - FY23

[17]Source: TCSRD MIS FY20 to FY23

1.2 Sampling

Location	Sub-Theme	Project Name	Methodology	Achieved Targets	
				Key Informant Interviews	Focus Group Discussions
Okhamandal, Mithapur - GJ	Women Empowerment	Self Help Group Formation 236 SHGs formed, 3000 members	Qualitative Assessment with on-Field Visits	Enterprises-2 (Forklift and Flour mill) SHG Federation president (1) Project team (1) Financial Institutions (1)	SHG FGD -5
Dwarka - GJ		Self-Employment and Enterprise Development 1. Dwarkesh - support to micro/small enterprises 2. Nirantar - PWD involved in setting up flour mills, supplier for Dwarkesh 3. Enterprise which supplies forklifts and cars to TATA Chemicals			

Table 2: Primary Research Sampling

2. Building Social Capital

At the heart of TCSRD's initiatives lies a commitment to building social capital for long-term sustainability. These efforts span a range of interventions, including women empowerment, reducing inequality among marginalized communities through Affirmative Action, promoting community engagement, strengthening Community-Based Organizations (CBOs), fostering partnerships, and establishing sustainable social enterprise models.

In women's empowerment, TCSRD recognizes women's crucial role in societal advancement. Despite their significant contributions to family income and household responsibilities in rural settings, women often face disparities in recognition and economic autonomy. TCSRD's interventions aim to rectify these disparities by promoting financial independence through various initiatives.

Within the larger framework of Building Economic Capital, focusing on Building Social Capital, attention shifts to women's non-farm livelihoods. This shift is facilitated through initiatives like the Okhai Empowerment Center and Cluster and Rural Enterprise Development, where women are organized into collectives known as Self-Help Groups (SHGs) and Clusters. Various activities aimed at women's empowerment were implemented under these initiatives through the SHGs as listed below:

2.1 Overview & Impact of Projects

Mithapur, situated in Gujarat, India, boasts a diverse demographic landscape characterized by a vibrant population. Women constitute a significant segment of the community, often belonging to the SC and OBC communities. Women are engaged in both agricultural and non-agricultural sectors and are crucial in driving the local economy forward. Despite facing socio-cultural obstacles such as limited access to education and job opportunities, the women of Mithapur exhibit remarkable resilience and determination. They actively preserve the region's rich cultural heritage through traditional art forms and handicrafts, underscoring their steadfast commitment to sustaining local traditions.

Traditionally, women in this region have hesitated to extend their engagement beyond household roles, primarily focusing on farming and domestic responsibilities. Recognizing this prevailing pattern, interventions by TCSRD were designed to empower women by enhancing their skills and integrating them into the local economy. These efforts proved pivotal in fostering social capital among women, improving their economic productivity, and elevating their social status within the community.

2.1.1 Self-Help Group (SHG) Formation

The Self-Help Group (SHG) concept epitomized the principle of "Unity is Strength," as informal associations joined forces for collective action towards shared objectives. TCSRD's SHG initiative, initiated in one village in Mithapur in 1996 and expanded to cover 37 villages across two blocks in Devbhumi Dwarka district, was crucial in empowering rural women by promoting savings and financial literacy. TCSRD supported these groups by offering training, facilitating bank connections, providing micro-credits, and arranging regular meetings.

TCSRD economically empowered SHG members through these activities, enhancing household decision-making and fostering community upliftment. Additionally, TCSRD facilitated linkages for SHG members with government departments and like-minded organizations. Notably, the "Hun Pan Digital" program specifically focused on training women to use digital payment apps and offering digital financial education to SHGs. This empowerment initiative aimed to help them transition into the digital world, reducing the need for physical travel and mitigating safety risks during the height of COVID-19.

2.1.2 Self-Employment & Enterprise Development

TCSRD empowered SHGs to start diverse businesses, including local product manufacturing and handicrafts, by providing inter-loan support, connecting them with banks for loans, and sharing information on income-generating opportunities, enabling them to establish and grow their businesses effectively. These efforts led to economic empowerment and boosted the self-reliance of women, improving their socio-economic status.

TCSRD's support reached community-based organizations such as the Dwarkesh Foods Foundation and the Nirantar Group Masala Unit, which economically empowered women and served as models of resilience and entrepreneurship for societal transformation. The Dwarkesh Foods Foundation, established by SHG women in collaboration with the District Industrial Commission, Khambhalia, produces various products infused with Okhamandal's flavors. Similarly, the Nirantar Group Masala Unit, run by women with disabilities, specializes in products like besan and spices.

By establishing SHGs, TCSRD effectively reached over 3,010 women across 236 SHGs in 37 villages by 2023. The organization provided 2,975 capacity-building trainings, offered social security schemes to 978 women, and involved 620 women through the Hun Pan Digital initiative. Additionally, under the Building Social Capital (Women Empowerment) theme, the project engaged over 12,141 women across various initiatives in 2022.

Impact numbers of TCSRD under Women Empowerment[18]:

Parameters	As on FY23
Mithapur	
Number of SHGs	236
Members in SHG	3010

Table 3: No. of SHGs and no. of members in the SHGs

Parameters	FY21	FY22	FY23
Women covered in capacity building	1,008	875	1092
Women covered in social security schemes	397	581	0
Women covered in Hun Pan Digital	460	160	NA

Table 4: No. of women covered in different activities from FY21 - FY23

The primary interactions with the SHG women, SHG Federations, Financial Institutions, and the Entrepreneurs on the ground provided the following insights into the project's impact.

Formation and Functioning of SHGs: The formation of Self-Help Groups (SHGs) has provided women with a platform to save money collectively and access low-interest loans at 12.5% annual interest for entrepreneurial endeavors. The women expressed that the primary motivations to join the SHGs were saving money and taking loans for income-generation activities.

"The motivating factor for joining this group was to save money and do any activity regarding income generation. Most importantly, we get loans on a 1% rate (monthly) of interest as and when required." - SHG from Lalsinghpura village.

Initially, in 2003, the women started by investing 25-30 rupees per person. Presently, they save between 100 and 400 rupees per month in the group account and utilize loans when necessary against their savings. Despite the challenges posed by the peak of COVID-19, the women have consistently achieved the set targets for savings. Collectively, they have saved 202.76 lakh rupees from 2020-21 to 2022-23 (Figure 1). Additionally, the women obtained up to 522 lakh rupees through banks in the same period. (Figure 2).

[18]Source: TCSRD Annual Report: '21-'22

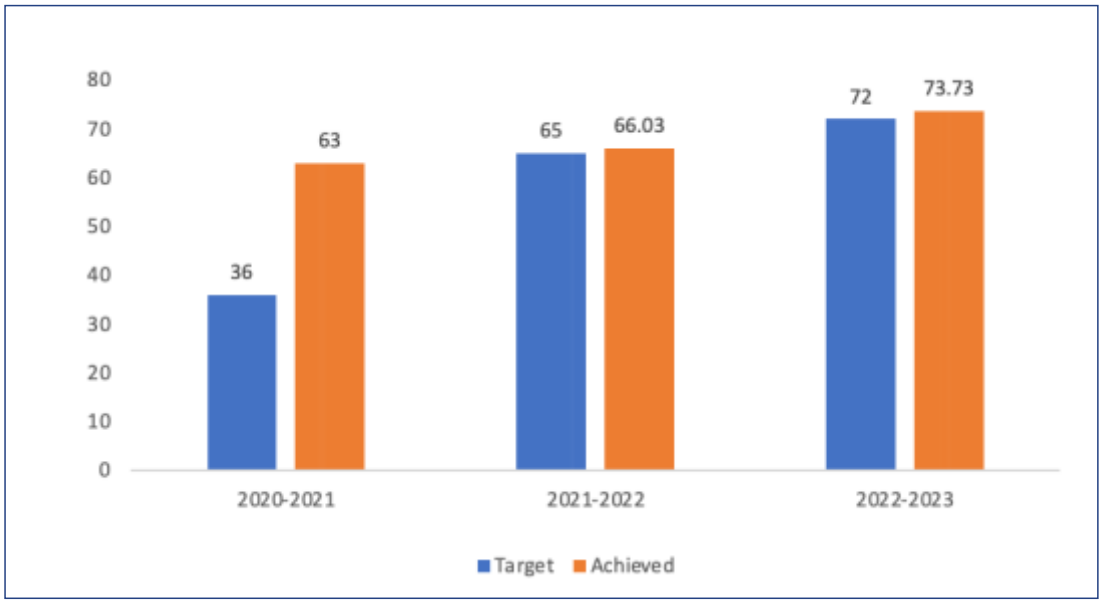

Figure 1: Total Savings by SHGs from FY20 to FY23

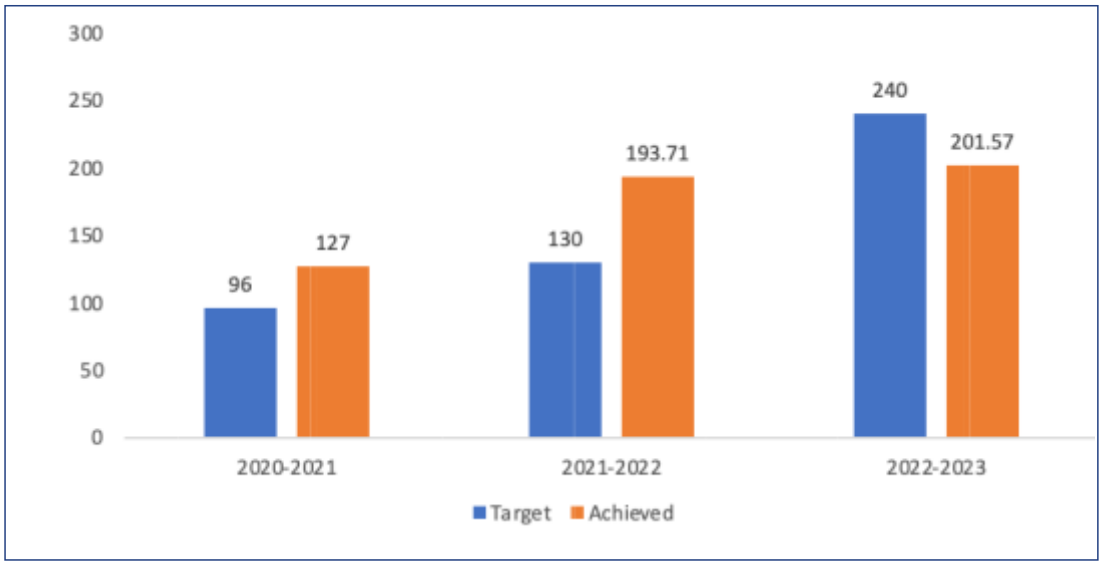

Figure 2: Total Interloaning among SHG members from FY20 to FY23

Participation and Training: Women have actively participated in SHG activities, including attending training sessions provided by TCSRD. These trainings covered the functioning of SHGs, maintaining financial transactions, sewing, tailoring, and capacity-building workshops. This enabled some women to take up sewing and embroidering as an income-generating activity in addition to agriculture and animal husbandry.

"We were provided training regarding bookkeeping and tailoring. Some of the SHG members do activities for income generation through tailoring, which TCSRD supplied. We bought tailoring machines independently." - SHG from Shivrajpur village.

Impact on Social and Economic Empowerment: The involvement in SHGs has led to social and economic empowerment among women. They feel confident managing their finances, accessing banking services independently, and participating in household decision-making processes. Women across the villages have expressed improving their economic condition and social confidence after joining SHGs.

"We started going out for banking work in the bank and meeting outside our houses and village. Our economic condition is better after joining SHG." - SHG from Makanpura village.

The respondents expressed growing support from their families, who were reluctant and initially opposed it. As the women started saving and contributing financially through loans and additional income-generating activities, they became part of the household decisions and spoke openly.

"Initially, our families were against women participating in the SHG activity. However, after obtaining loans and fulfilling their needs, our family members came to appreciate the initiative, and their support for us continued." - SHG from Makanpura village.

It was noted that women remained reluctant to participate in the panchayat meetings, which were predominantly led by male members, with only men from the family attending. Participation from SHG members was limited, with only the SHG presidents attending when specifically invited or required.

Challenges and Support :

While there have been challenges in maintaining financial records initially, women have overcome these hurdles with training and support from TCSRD. Family and community support have also encouraged women to participate in livelihood activities and SHG initiatives.

"Initially, we needed help maintaining financial records during the early stages. However, after receiving training, we overcome these challenges. After that, we formed new SHG groups, including new members. However, many SHG members are primarily occupied with household responsibilities, which limits their availability to attend meetings." - SHG from Lalsinghpura.

Empowering women in Okhamandal requires overcoming significant hurdles. Remote locations often lack basic facilities, particularly education, hindering knowledge acquisition and limiting opportunities. Even travel and access to transportation is a challenge, restricting their ability to participate in group activities. As the TCSRD team emphasizes, simply visiting a bank represents a major step towards empowerment for these women. This achievement stands tall in a society of traditional mindsets which create barriers discouragin women from pursuing financial independece and leadership roles. Despite navigating complex realities like geographical isolation, illiteracy, social norms, and even natural disasters like pandemics, these women demonstrate remarkable resilience in their pursuit of a brighter future.

Future Plans and Scope for Improvement: Women were eager to engage in future income-generating activities like embroidery and dairy farming, indicating a desire for further economic empowerment. However, there was a need for additional support and training, especially in enhancing skills and exploring new avenues for income generation. Some respondents highlighted the potential to improve income-generation activities within SHGs.

Effectiveness and Best Practices: The SHG program effectively promoted self-reliance and financial independence among women. The best practices identified included the flexibility of loan access, regular savings, and the supportive environment within SHGs. These practices contributed to the success and sustainability of the program.

TCSRD's initiatives under the theme of Building Social Capital, with a subtheme of Women's Empowerment, epitomize its commitment to fostering sustainable development, economic empowerment, and societal transformation. The initiatives have transformed women's lives, promoting financial independence, social empowerment, and community support. However, there is still room for improvement. Expanding income-generating opportunities and providing ongoing training and support to SHG members are areas where further enhancements can be made.

2.1.3 Analysis

Parameters	Description
Relevance	The Mithapur region of Gujarat is home to a population primarily reliant on farming and animal husbandry, mirroring the agricultural dependence seen in many rural areas across India. In line with typical rural dynamics, women in this region traditionally hesitated to engage beyond their household roles, focusing on farming and domestic responsibilities. Recognizing this pattern, interventions by TCSRD aimed to empower women by enhancing their skills and integrating them into the local economy. These efforts were pivotal in fostering social capital among women, bolstering their economic productivity, and elevating their social status within the community.
Effectiveness	TCSRD's women empowerment interventions were strategically designed to bolster women's confidence, develop their capabilities, instill financial literacy, promote savings, and facilitate additional income generation opportunities. The study unequivocally affirmed the successful realization of these objectives through forming SHG groups and establishing several small enterprises, with the women wholeheartedly expressing satisfaction with the project interventions.
Efficiency	The training for sewing and embroidery lasted over three months, and the SHGs constantly received handholding on maintaining the books and taking loans from the banks. In addition, the intervention successfully opened up multiple small enterprises to promote economic activities within the project time, using the existing human resources. Economically, the project spent 55.17 lakh rupees under the women empowerment (SHG Program) in 3 years and reached more than twelve thousand women annually. Thus, an efficient project delivery system for resource utilization has been observed.
Coherence	The SHGs collaborated with local bank branches to establish savings accounts and access low-interest loans, effectively improving their financial stability and promoting a saving culture among women. Additionally, women received training in sewing and tailoring, enabling them to contribute to TCSRD's Okhai brand initiative, known for producing handmade traditional clothing items. This endeavour offered them an extra source of income and bolstered their economic empowerment.

	However, women voiced concerns about the limited microfinance opportunities beyond the loans offered through SHGs. They also wanted to engage with various local livelihood and employment options. Government options such as NRLM/SRLM, to further enhance their economic prospects can be explored. Thus, the initiative can focus on bringing more collaborations outside the TCSRD umbrella to gain more flexibility and access to government schemes.
Impact	The initiatives brought about a significant transformation in women's lives, both socially and economically. Participation in the SHGs allowed women to break out of their comfort zones, acquire new skills, and achieve independence. Engaging in economic activities and savings led to greater involvement of women in family decision-making processes and contributed to enhanced financial stability for their families.
Sustainability	The SHGs, operating for periods ranging from 6 to over 20 years, have yielded substantial and enduring transformations among women. However, it was noted that these initiatives on SHGs and women empowerment relied on TCSRD's interventions and financial backing through CSR funding. To bolster the sustainability of community development efforts, the team could prioritize forging external partnerships and empowering local community leadership, enabling greater self-reliance within the communities themselves.

Table 5: Analysis across the REECIS parameters

2.1.4 Practices Worked Well & Not Worked Well

Project	Activity/Practice	Worked Well	Can Be Improved
SHG Formation	Evaluation of the SHGs	SHGs benefited from the evaluation system that provided clear performance rankings (A, B, C, D), aiding groups in identifying their strengths and areas for improvement and providing options for cross-learning from the high-performing groups.	
	Training of the SHGs	After evaluation, identified groups received targeted guidance and training (such as proper record-keeping and tracking loan repayments), facilitating an option for all the SHGs to have the same know-how of processes.	The training can focus on digital literacy and financial inclusion through collaboration with financial institutions to further enhance loan facilities.

	Annual meeting of the SHGs	The yearly SHG meeting cultivated community spirit and knowledge exchange. Women members shared experiences, discussed challenges, and celebrated success.	
	Exposure visits of the SHGs		SHGs should participate in more frequent exposure visits to enhance learning and growth. These visits can be facilitated through collaboration with other organizations.
	Handholding support for the establishment of enterprises		Improved emphasis can be placed on facilitating the establishment of enterprises by Self-Help Groups (SHGs), as the women have expressed willingness to partake in more economic activities.
Enterprise Development	Handholding support to the individuals for enterprise setup	The provided support has been instrumental in enabling Persons with Disabilities (PWDs) and women to initiate their enterprises.	

Table 6: Outcome achievement matrix - Building Social Capita

3. Recommendations

Based on the interactions with stakeholders engaged in TCSRD's women empowerment initiatives and from the industry best practices, the study proposes the following recommendations to enhance their impact further.

1. Innovative ideas for the Enterprise establishment: The primary research indicates that the existing SHG clusters in Mithapur need more group participation. To tackle this issue, there's a need for innovative enterprise ideas that encourage women to collaborate in working and managing businesses collectively. This collaborative approach will enhance the SHG network and empower more women to attain economic independence.

2. Exposure visits or meetings with successful SHG: To encourage collaboration and stimulate innovative business ideas, contemplate arranging exposure visits or meetings with successful SHG clusters. By

engaging with prosperous SHGs from different areas, the Mithapur women's SHGs can glean insights into effective collective business management practices. Observing how other groups have organized their enterprises and addressed obstacles can inspire creativity and offer a blueprint for establishing robust, cooperative ventures within their clusters. This exposure can instill a sense of potential and enable the Mithapur SHGs to strive for comparable success.

3. Business training for SHGs: To prepare SHG members for establishing and managing collective enterprises, consider offering specialized business training programs. These programs can include product costing, financial management, marketing strategies, and effective group communication. By enhancing their business skills, SHG members will be better equipped to make informed decisions, overcome challenges, and sustain their collaborative ventures in the long term.

4. Digital Literacy: Providing digital literacy skills will empower women to utilize technology for their SHG activities or businesses. Training programs can concentrate on using online tools for marketing and sales, financial management, and accessing government resources. Enhancing their digital proficiency will boost their visibility and market reach and unlock new opportunities and information sources, promoting innovation and growth within their collective enterprises.

5. Partnering with banks for the monthly savings collection: To improve financial management, consider collaborating with local banks to arrange for their executives to collect the monthly savings of SHGs in the villages. This secure and efficient process would alleviate the manual collection burden on SHG leaders and promote financial discipline among members by encouraging regular saving habits. Moreover, such partnerships could facilitate SHGs' access to formal banking products and services, fostering their financial inclusion and long-term development.

6. Awareness of Government Schemes: SHGs should know relevant government schemes to leverage their benefits. This knowledge will help them understand the financial grants, subsidies, and skill development programs tailored to support rural women-led businesses. Equipping women with this information can provide access to valuable resources, reduce economic burdens, strengthen their enterprises, and facilitate sustainable growth.

7. Linkage with the State Rural Livelihood Mission: TCSRD should explore connecting with the State Rural Livelihood Mission (SRLM), which could greatly benefit the SHGs. The SRLM provides training programs, access to micro-credit schemes, and grants to aid rural self-help groups. Partnering with the SRLM can empower the SHGs with crucial financial support, opportunities for skill development, and access to vital government programs, helping them achieve greater economic empowerment and success in entrepreneurship.

8. Collaboration with other organizations: To enhance the SHG network and increase its effectiveness, explore collaboration opportunities with organizations like SEWA Bharat and Udyogini. Partnering with NGOs specializing in business development, microfinance, or marketing can offer SHGs access to valuable resources, mentorship, and potential new markets.

4. Conclusion

Tata Chemicals Limited's CSR, with the help of TCSRD, has focused on building the social capital of rural women in the Okhamandal region through SHG and Enterprise development to overcome economic marginalization and social disenfranchisement between the financial years 2020-21 to 2022-23, under the theme of “Building Social Capital.”

TCSRD's strategic interventions, such as establishing SHGs and supporting self-employment, have significantly empowered rural women across various villages. By fostering economic independence, providing training, facilitating bank linkages, and promoting entrepreneurship, TCSRD has enabled over 3,000 households to enhance their livelihoods and decision-making capabilities. The SHGs have improved financial stability and strengthened community bonds and social capital, leading to a ripple effect of positive change within rural households.

TCSRD's commitment to empowering women through Self-Help Groups (SHGs) has been crucial in advancing financial independence and community development. These SHGs are compelling examples, demonstrating their effectiveness in fostering self-reliance, driving economic empowerment, promoting social cohesion among rural women, and highlighting the importance of ongoing support and comprehensive training.

Economic autonomy and collaboration among SHGs should be enhanced as a comprehensive strategy. Firstly, innovative enterprise ideas within these groups should be fostered, cooperation should be encouraged, and financial independence should be promoted. Prioritizing specialized business training programs is critical to equipping SHG members with the necessary skills for effective collective enterprise management. Additionally, initiatives aimed at improving digital literacy among women in SHGs are crucial to leveraging technology for business expansion and market reach.

Simultaneously, establishing robust partnerships with financial institutions, especially banks, is imperative to facilitate efficient savings collection and promote economic inclusion among SHG members. Furthermore, raising awareness about government schemes and fostering collaborations with organizations like SEWA Bharat and Udyogini are essential steps to optimize the effectiveness of SHGs, ensuring their sustained impact and viability within the socio-economic landscape.

In conclusion, TCSRD's efforts in building social capital and empowering rural women through SHGs have been commendable. By implementing the suggested improvements and supporting women's economic and social empowerment, TCSRD can further catalyze sustainable development and positive change within rural communities.

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contact@nusocia.com
www.nusocia.com
/ @nusocia