Executive Summary

LTTS-AKRSP, Dangs

1 Introduction

L&T Technology Services Limited (LTTS), a subsidiary of Larsen & Toubro Limited, specializes in Engineering and R&D (ER&D) services, catering to various industries such as industrial and consumer products, medical devices, transportation, and telecom. LTTS is committed to fostering inclusive growth through corporate social responsibility (CSR) initiatives, focusing on community development, health, education, and sustainability.

As part of its CSR efforts, LTTS partnered with the Aga Khan Rural Support Programme (India) [AKRSP(I)] to implement the "Integrated Village Development" project in the Dangs district, a predominantly tribal and underdeveloped region in Gujarat. The region faces challenges such as water scarcity, monocropping, and migration due to limited livelihood opportunities. The project aims to improve agricultural practices, enhance livelihoods, and build community resilience.

Key objectives of the project include:

- Capacity building of tribal farmers through training and exposure.
- Introduction of solar mini-lifts for irrigation.
- Promotion of efficient irrigation practices like drip and rain pipe irrigation.
- Land levelling to expand cultivable land.
- Diversification of agriculture and alternative livelihoods through orchards.

AKRSP(I), known for its participatory development approach, leads the initiative with a strong focus on natural resource management, sustainable agriculture, and community-based collectives. The program's major achievements include reducing soil degradation, expanding irrigation for small farmers, increasing agricultural productivity, and providing alternative income through initiatives like mango orchards and fish farming.

2 Objective of the study

L&T Technology Services (LTTS) CSR commissioned the Social Audit Network (SAN), India, to assess the social impact of the Integrated Village Development Project in The Dangs, executed by the Aga Khan Rural Support Programme (India). The study aimed to evaluate the project's relevance, efficiency, effectiveness, sustainability, and social impact, and to recommend strategies for its long-term success.

3 Programme Overview

The partnership between LTTS and AKRSP(I) demonstrates the potential of CSR-led programs in empowering marginalized communities through sustainable agricultural practices and livelihood development. The project has made significant progress in addressing water scarcity, improving agricultural productivity, and enhancing the income of tribal farmers in the Dangs district.

To ensure sustainable impact, the project followed a systematic approach involving baseline assessments, development planning, regular monitoring, and monthly review meetings. Between April 2022 and March 2023, the project supported 268 farmers with solar-based lift irrigation, 719 farmers with land levelling, and 310 farmers with horticulture initiatives.

Water Resource Management: Water resource management is a critical element in Indian villages, heavily reliant on agriculture and facing challenges like water scarcity and inefficient irrigation practices. Effective management ensures sustainable agriculture, improves livelihoods, and addresses climate change impacts. LTTS and AKRSP (I) have made significant strides in addressing water management issues.

Solar-Based Mini Lift Irrigation Units offer sustainable, low-cost water access for farmers. Powered by solar photovoltaic (PV) panels, these systems lift water from sources like rivers or wells and distribute it to agricultural fields. Benefits include reduced energy costs, lower environmental impact, and resilience against water scarcity.

Solar PV panels, water pumps (submersible/surface), and a solar charge controller were provided to beneficiaries. 18 solar irrigation units installed across project areas, benefiting 268 farmers. These units replaced diesel engines and electric motors, reducing operational costs.

Farm Ponds capture rainwater and runoff, providing essential water storage for irrigation during dry spells. These ponds promote sustainable water management and help mitigate droughts and floods. It also ensured water conservation, livestock water supply, and crop diversification and led to Groundwater recharge and soil fertility improvement. LTTS-AKRSP (I) has provided 17 farm ponds covering 18 hectares, benefiting 51 farmers. Each pond, costing ₹310,000, significantly improved agricultural productivity.

Farm-Based Activities

The following farm-based initiatives have significantly transformed agricultural practices in The Dangs district:

- **Horticulture**: LTTS-AKRSP (I) supported 259 farmers with mango saplings (Kesar variety), with an expected yield of 20-30 kg per plant in 3-4 years. Waghai received 71% of this support, followed by Ahwa and Subir.

- **Drip Irrigation**: This water-efficient system benefited 93 farmers across 3.85 hectares, enhancing crop yields and saving water. Waghai received the most coverage (2.4 hectares), while Ahwa and Subir received lesser support.
- **Vegetable Cultivation**: 263 farmers received inputs for vegetable cultivation, with support focused on creeper vegetables. Ahwa started receiving support in 2023, while Waghai saw a drop in support from 2022 to 2023.
- **Soil Conservation**: Techniques like contour farming and mulching were employed to reduce erosion and preserve soil fertility.
- **Tree Plantation**: 32,789 saplings were planted across 70 villages, improving soil conservation, preventing erosion, and generating income through agroforestry.
- **Land Levelling**: Over 36 hectares of uneven land were leveled, benefiting 719 farmers and improving irrigation efficiency.

4 Report on Performance

Relevance: The program area faces challenges such as heavy rainfall and steep terrain, leading to soil erosion and water scarcity during summer. Tribal farmers, with limited resources, lacked access to efficient irrigation techniques and horticulture. The LTTS-AKRSP (I) intervention has improved water conservation and crop diversity, enhancing livelihoods and reducing migration.

- **Key Impacts**:
    - Solar mini lift irrigation systems reduced water procurement time and energy costs.
    - Drip irrigation increased water efficiency and crop yields.
    - Farm ponds stored rainwater, ensuring irrigation during dry periods.
    - Diversified crops like vegetables and fruits improved nutrition and food security.

Effectiveness: The solar mini lift irrigation systems have proven effective in tribal areas, increasing crop yields. Drip irrigation and farm ponds have significantly enhanced water conservation and agricultural productivity. Farmers participate in the maintenance of these systems, ensuring sustainability. Women have actively engaged in vegetable cultivation and income generation through activities like fish farming. Women cultivating ladies finger generate sufficient income to support their families, with sales in high-demand markets nearby.

These initiatives have not only improved agricultural productivity but also empowered women, enhanced food security, and stabilized rural economies in the region.

Efficiency: The efficiency of solar mini lift irrigation, farm ponds, horticulture, drip irrigation, and vegetable cultivation significantly influences the success of agricultural practices in tribal areas. The solar mini lift irrigation system has shown to be highly efficient, particularly in regions with abundant solar energy. By harnessing renewable energy, it reduces the need for conventional electricity or diesel-powered systems, cutting costs and lowering environmental impact. This technology has allowed farmers to irrigate their fields consistently, even during dry spells, ensuring improved agricultural productivity.

Drip irrigation has exhibited high water-use efficiency, which is critical in areas prone to water scarcity. The system minimizes water wastage by delivering water directly to the plant roots. This has led to significant water savings and increased crop yields, especially for farmers who rely on limited water resources. Farm ponds, as a water conservation strategy, have also proved efficient in storing rainwater for later use, benefiting both irrigation and livestock.

Vegetable cultivation has emerged as an efficient means for small-scale farmers to utilize their land while maximizing output. This practice has not only contributed to higher incomes but also bolstered food security, providing essential nutrition to tribal communities. The collective impact of these practices has been instrumental in boosting agricultural productivity, conserving resources, and improving the livelihoods of tribal farmers.

Sustainability: The sustainability of the interventions has been a key factor in the long-term success of the LTTS-AKRSP (I) program. Solar mini lift irrigation has been transformative in reducing reliance on fossil fuels and promoting eco-friendly practices. It has significantly decreased carbon emissions while providing a reliable source of water, thus enhancing agricultural resilience and supporting sustainable development in tribal areas.

Farm ponds contribute to water sustainability by capturing and storing rainwater, reducing the pressure on natural water resources. These ponds also provide crucial ecosystem services by supporting biodiversity and promoting groundwater recharge. Drip irrigation, known for its water conservation capabilities, ensures that water is used judiciously, enhancing crop yields without depleting local water reserves. It also reduces nutrient runoff, promoting soil health.

The introduction of horticulture has promoted sustainability by encouraging crop diversification, reducing dependence on monoculture, and improving soil fertility through organic farming practices. The inclusion of vegetable cultivation has ensured food security and provided a steady income source, reinforcing the economic sustainability of tribal communities.

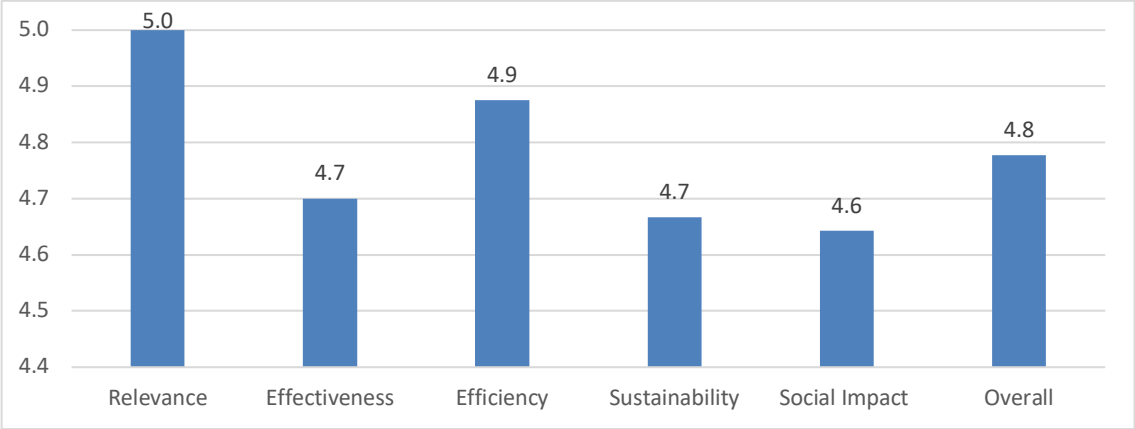
Social Impact: The introduction of solar irrigation systems, farm ponds, and advanced farming techniques has had a profound social impact on the tribal communities in The Dangs. One of the most significant outcomes has been the alleviation of water scarcity, leading to increased agricultural productivity and improved livelihoods. The reliable access to water has enhanced food security, ensuring that families have a consistent supply of nutritious produce.

Increased crop yields and the adoption of modern agricultural practices, such as horticulture and vegetable cultivation, have led to higher incomes for farmers. This economic growth has, in turn, contributed to rural development by reducing migration to urban areas, as locals find better income opportunities within their communities. The reduction in migration has also stabilized local economies and supported community cohesion.

The program has empowered women, who play a significant role in agriculture. The reduction in manual labor through improved irrigation methods has allowed women more time for personal development and other activities, promoting gender equality. Additionally, the increased economic stability has improved living standards in rural areas, enabling families to invest in education, healthcare, and infrastructure.

The above parameters have been scored on a rating scale of 1 to 5 where 5 is the highest.

Overall REESS Score



5 Conclusion

The partnership between L&T Technology Services (LTTS) and Aga Khan Rural Support Programme (India) (AKRSP (I)) has significantly impacted The Dangs through the Integrated Village Development Programme. By implementing solar lift irrigation, farm ponds, drip irrigation, and promoting horticulture, the program has greatly improved agricultural productivity, water management, and resource efficiency.

These efforts have empowered tribal farmers with modern farming techniques, fostering self-reliance and reducing inequalities. The collaboration highlights the importance of strong partnerships and community engagement in driving positive socio-economic changes. Looking forward, sustaining and expanding these initiatives will be crucial for further advancing sustainable and inclusive agricultural practices.

Executive Summary

LTTS & NAF

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1. Introduction

The Sujal and Sujal+ Watershed Project, a collaboration between L&T Technology Services (LTTS) and the National Agro Foundation (NAF), addresses the urgent need for sustainable water resource management in three water-scarce villages of Chengalpattu District, Tamil Nadu. This project was driven by the increasing pressures of population growth, urbanization, and climate change, which have degraded many watersheds, resulting in water scarcity, biodiversity loss, and vulnerability to natural disasters. The project aims to enhance water availability, improve agricultural productivity, and promote socio-economic development through sustainable watershed management practices.

L&T Technology Services, a global leader in engineering and R&D, contributed INR 1.97 crore to the Sujal initiative as part of its Corporate Social Responsibility (CSR) efforts. LTTS focuses on environmental sustainability through initiatives promoting water conservation, afforestation, and community development. NAF, with expertise in sustainable agricultural practices and community-based watershed management, implemented the Sujal and Sujal+ programs.

The primary goals of the project include improving water resource management, providing training and capacity building for local farmers and women's self-help groups, and enhancing agricultural productivity through sustainable practices. Key interventions included the construction of check dams, percolation tanks, and field bunds, along with afforestation efforts. Training in integrated farming, livestock rearing, and agricultural techniques helped improve livelihoods in the community.

2. Objective & Scope

A comprehensive impact assessment conducted by the Social Audit Network, India evaluated the project's effectiveness from June 2021 to March 2023. The assessment found that the project successfully improved water availability, increased agricultural productivity, and empowered local communities through skill development. The study also identified positive environmental impacts, such as increased green cover and improved soil and water conservation.

3. Programme overview

The Sujal and Sujal+ Watershed Projects aimed to enhance water management, agricultural practices, and community development in three villages of Chengalpattu district. The projects' key strategies included:

1. **Water Resource Development**: Construction of check dams, percolation tanks, and trenches to improve water availability and soil conservation.
2. **Training & Capacity Building**: Farmers and women received training in integrated farming, cattle and goat rearing, and agro-business, with significant community participation.
3. **Improved Agricultural Practices**: Introduction of LEAN farming, soil health management, and sustainable practices increased productivity and sustainability.

These initiatives resulted in improved groundwater levels, enhanced crop yields, and empowered local communities through better livelihood opportunities. Additional community projects included health camps, agroforestry efforts, and the installation of solar lights and smart boards in schools.

4. Report on Performance

The Sujal and Sujal+ Watershed Project was evaluated using the **REESS framework** (Relevance, Effectiveness, Efficiency, Social Impact, and Sustainability) to assess the overall performance and outcomes.

Relevance: The Sujal and Sujal+ projects were highly relevant to the water-scarce region of Chengalpattu, Tamil Nadu. Groundwater data classified the area as semi-critical, indicating significant stress on water resources. The project's interventions, such as constructing check dams, percolation tanks, and channel formations, were crucial to improving water availability, groundwater recharge, and soil conservation. The emphasis on sustainable agricultural practices, including soil testing, micronutrient supply, and organic fertilizers, directly addressed the community's dependence on agriculture. The planting of 8,500 agroforestry saplings enhanced soil health and reduced erosion, further supporting agricultural productivity. Other key elements, like the installation of a water supply system and solar streetlights, were vital for community safety and health, while capacity-building programs for farmers and Self-Help Groups (SHGs) provided the necessary skills for sustainable livelihoods.

Effectiveness: The project achieved significant results in enhancing water management, agricultural productivity, and community development. Groundwater levels improved, rising from 2.3 meters to 4.2 meters in summer and 7.8 meters to 8.9 meters in the monsoon season. Soil conservation efforts, such as Water Absorption Trenches (WATs) and Check Dams (CCTs), reduced runoff and siltation in water bodies, while agricultural productivity increased due to the introduction of lean farming techniques and the use of organic fertilizers. Veterinary camps and improved livestock infrastructure, such as cattle ponds, led to better livestock health and productivity. Training programs successfully equipped farmers with sustainable practices, while SHG members gained valuable skills for self-employment. The installation of solar streetlights enhanced village safety, and technological improvements in schools improved student engagement and learning outcomes. Over 80% of participants reported improved practical knowledge and productivity.

Efficiency: The project was implemented efficiently, with resources allocated effectively to key areas like water management, agricultural enhancements, and income generation programs. Water infrastructure,

such as check dams and percolation tanks, was completed on time, directly addressing the community's immediate water needs. Agricultural improvements, including soil testing and the application of organic fertilizers, were well-executed, resulting in better crop yields and soil health. The planting of 8,500 saplings was maintained effectively, contributing to increased green cover. Veterinary camps and the installation of solar streetlights were efficiently managed, meeting livestock health needs and improving community safety. Training programs were well-organized and provided timely support to farmers and SHG members, enhancing their skills and economic prospects.

Social Impact: The project had a profound social impact on the targeted communities. Improved water management and agricultural practices led to enhanced agricultural productivity, providing economic stability to farmers and reducing dependency on harmful chemical inputs. Agroforestry and water conservation efforts improved environmental health and biodiversity, while the introduction of renewable energy solutions, such as solar streetlights, increased community safety and reduced reliance on conventional power sources. The project also empowered women through income generation programs, providing financial independence and increasing their role in community development. The installation of smart boards in schools transformed educational experiences, fostering a more interactive and engaging learning environment. Health interventions, including veterinary and health camps, improved overall well-being for both the community and livestock.

Sustainability: The Sujal and Sujal+ projects demonstrated a strong commitment to long-term sustainability.

- **Infrastructure Sustainability**: The water management structures, such as check dams and percolation tanks, were built for durability with minimal maintenance requirements, ensuring continued functionality. Solar streetlights provided a cost-effective and environmentally sustainable lighting solution. Cattle ponds and water supply systems were maintained by the local community, ensuring long-term use.

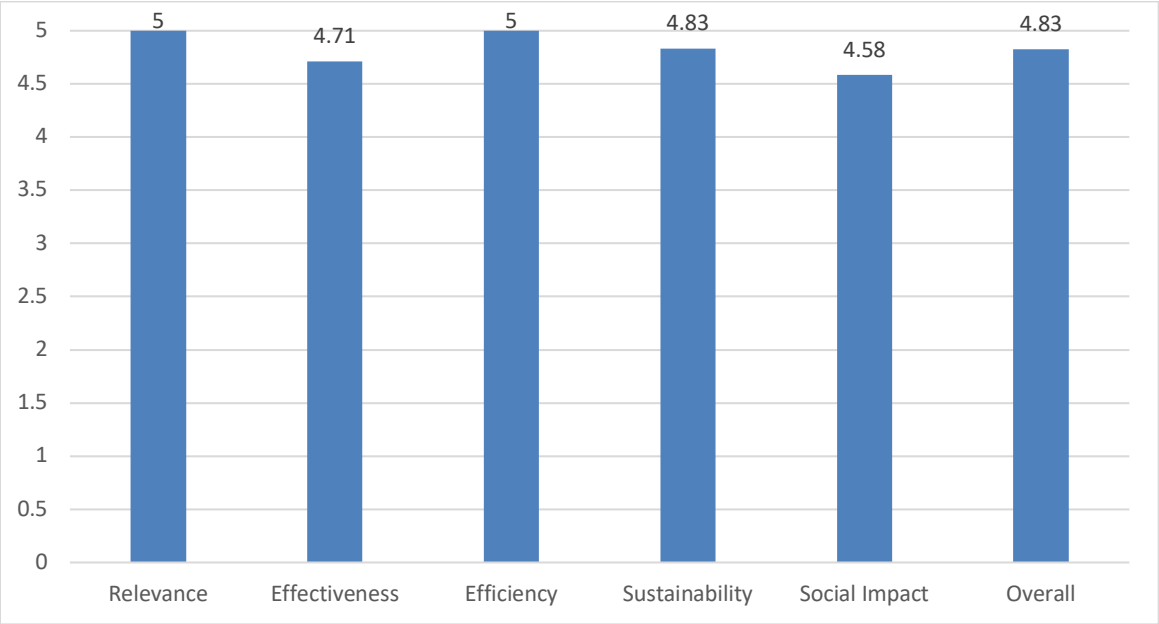
- **Economic Sustainability**: The project improved agricultural productivity through better water management and sustainable farming techniques. The income generation programs diversified income sources, empowering women and creating economic resilience. These initiatives laid the foundation for long-term economic stability in the community.

- **Environmental Sustainability**: The project promoted environmental sustainability through tree planting, soil conservation, and the use of organic fertilizers. Solar-powered pest traps reduced chemical inputs and minimized environmental impact. These efforts contributed to improved biodiversity and ecological balance in the region.

- **Social Sustainability**: Capacity-building programs strengthened the community's ability to maintain and build upon the project's outcomes. Educational advancements through the installation of smart boards equipped future generations with valuable skills, while health interventions ensured long-term community well-being. Women’s empowerment initiatives fostered social inclusion and contributed to sustainable development in the villages.

The above parameters have been scored on a rating scale of 1 to 5 where 5 is the highest.

REESS Scorecard



5. Conclusion

The Sujal and Sujal+ projects have brought transformative change to communities in Chengalpattu district, addressing critical challenges while setting the stage for sustainable development. Through an integrated approach involving water resource management, agricultural improvement, and capacity building, the projects have boosted local economies, increased agricultural productivity, and empowered individuals. High community engagement, such as farmers investing in livestock, highlights the success of these initiatives in fostering proactive, sustainable practices. Beyond tangible achievements, the projects have cultivated a sense of ownership and self-reliance, leaving a lasting legacy of environmental stewardship and community resilience.