



MONITORING REPORT

Project Title	<i>Solar Water Pumps for Salt Farmers of Little Rann of Kutch, Gujarat, India</i>
Project Start Date	<i>12/10/2017</i>
Project End Date	Ongoing
Monitoring Report number	01
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W+ Project ID	01
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SUMMARY

WOCAN implemented the W+ Standard to measure and quantify the empowerment impacts of a renewable energy project involving the installation of solar-powered water pumps for salt production by women salt workers in the Little Rann of Kutch, Gujarat. The project replaces traditional diesel-operated pumps with solar photovoltaic (PV) systems, which convert solar energy into the mechanical energy required to extract brine. The solar PV systems operate during daylight hours, with diesel generators used only as backup during emergencies or for extended pumping needs.

This intervention is categorized under Type I – Renewable Energy for the purpose of carbon credit generation and is being implemented by Value Network Ventures (VNV) in partnership with the Grassroots Trading Network for Women, an initiative of green skilling and green livelihoods for the members of SEWA. The project contributes to climate change mitigation by displacing fossil fuel use, thereby reducing greenhouse gas (GHG) emissions, and aligns with co-benefit certification mechanisms under voluntary carbon markets.

Women are positioned as key stakeholders in this project. In addition to delivering environmental benefits, the initiative directly supports SDG 5.5, promoting women's full and effective participation and equal opportunities for leadership in economic life. To date, 1,292 solar PV systems have been installed for women salt farmers, with a long-term goal of reaching approximately 5,000 women beneficiaries.

Further, to measure and certify the social co-benefits, two domains of the W+ Standard were applied:

- Income & Assets – assessing the increase in gross annual income of the women salt workers and their control over productive resources.
- Education & Knowledge – evaluating the acquisition of technical skills, awareness, and decision-making capacity related to solar technology in use and salt production.

The quantified impacts in these domains have resulted in the generation of W+ Credits, which can be sold independently or alongside carbon credits to buyers seeking verifiable social and gender equity impacts. These credits demonstrate the project's dual value in promoting both climate resilience and women's empowerment at scale.



In addition, as per information shared by SEWA, between 2022 and 2024, this project generated a total of INR 64.87 lakhs from the sale of carbon credits (VNV as project developer). Of this amount, 10–20% was allocated to SEWA to support organizational operations. The remaining funds were utilized to benefit women salt farmers—primarily for loan repayments (including interest) they have taken for the solar pumps, and RUDI products to enhance household food security. All decisions regarding fund allocation were made in consultation with the women farmers themselves. It is to be noted that in the calculation of the change in Income, this was not included as the measurement team did not have access to information regarding exact disbursement to individual women salt workers.

The total sample size for the survey was 70 women salt workers (from the 1292 project beneficiaries) from the project area.

The following summarizes the impacts in the two domains and the number of W+ credits generated:

Income & Assets domain

- The average change in gross annual income for beneficiaries is INR 553,993 post project intervention.
- **The overall percentage of change in average gross annual income, pre and post intervention is 240%.**
- There is a 66.7% reduction in diesel consumption.
- **The total number of W+ credits generated is 31,034.**

Education & Knowledge Domain

- The average technical, financial and marketing knowledge, skills and confidence amongst women salt workers to apply them in practice showed an increase of 184.6% as compared to before project intervention.
- The total number of W+ credits generated is 23,854.

Do no Harm

No instances of direct or indirect harm—physical, emotional, or economic—were reported by the women salt workers. During the field investigation, it was observed that children aged 14 and above were occasionally present and provided assistance to their families in the salt pans. Importantly, no cases were reported of children below the age of 14 dropping out of school or engaging in labor, indicating general compliance with child labor regulations.



Challenges and Recommendations

Despite notable progress through solar-based salt production and improved income and skills, women salt workers continue to face persistent structural, financial, and environmental barriers. Limited financial autonomy, restricted market access, and gendered norms constrain their full participation and leadership. At the same time, climate variability and inadequate water management disrupt production. Addressing these interconnected challenges through inclusive financial tools, equitable market engagement, climate-resilient infrastructure, and gender-sensitive policy support is essential to unlock the full potential of women salt workers.

Recommendations

1. Scaling and Diversifying Solar Technologies for Greater Impact

This project has demonstrated a promising pathway to deepen both climate and gender impacts within the salt production sector. Survey findings and gender analysis clearly indicate that the adoption of solar pumps has not only improved working conditions and reduced reliance on diesel but also led to a significant rise in women salt workers' incomes. With over 5,000 women salt workers registered with SEWA, the expansion of solar pump technology across the region represents a high-impact opportunity—both in terms of improving livelihoods and achieving measurable greenhouse gas (GHG) emission reductions.

To further increase productivity and resilience, the project could integrate additional solar-based technologies such as solar dryers, brine heaters, and mechanized processing tools. These upgrades would reduce manual labor intensity, enhance salt quality, and increase overall yield. Incorporating such innovations would also result in greater displacement of fossil fuel use, thereby contributing to higher volumes of certified emission reductions (CERs) or verified carbon units (VCUs) under existing renewable energy methodologies. A well-structured scale-up strategy has the potential to generate significant additional carbon credits while simultaneously enhancing women's economic empowerment. In doing so, the project aligns with emerging carbon market trends that favor credits with verified social co-benefits, particularly those certified through standards such as the W+ Standard. This positions the initiative to attract greater interest from impact-driven carbon credit buyers seeking high-quality, gender-responsive offsets.

2. Ensuring Revenue sharing with women climate actors

This project demonstrates that women can be key contributors to the clean energy transition in salt production. Yet, their social and economic contributions often remain



unrecognized in carbon markets. Integrating a gender lens—through tools like the W+ Standard—offers a robust framework to measure and monetize co-benefits such as increased income, skills, health, and leadership. These verified gender co-benefits enhance the value of carbon credits, aligning with rising buyer demand for SDG-linked, high-impact offsets.

For carbon credit developers, this presents both a financial and social opportunity. By designing and embedding transparent, community-driven benefit-sharing mechanisms from the outset, developers can ensure that a meaningful portion of carbon revenues is returned directly to the women whose labor underpins these climate solutions. This not only drives local empowerment but also strengthens the credibility, equity, and long-term sustainability of the project.

3. Strengthening Financial Inclusion and Direct Market Access

Despite increased incomes, many women salt workers remain on the margins of the formal financial system. Survey findings and field discussions revealed continued reliance on informal savings, limited access to credit, and dependence on male intermediaries for market transactions. These barriers constrain women's financial independence and limit their ability to make strategic, long-term investments in their livelihoods.

Addressing this requires a focused push for financial inclusion. Tailored financial products—such as seasonal savings plans, low-interest working capital loans, and insurance schemes to mitigate production and health-related risks—can help build economic security. On the market front, there is clear potential to enhance women's agency. Equipping women with skills in pricing, branding, and direct sales can unlock greater value for their work. SEWA's RUDI initiative offers an existing platform for collective branding and marketing that could be leveraged to promote "solar salt" produced by women.

Notably, several women salt workers reported reinvesting increased earnings into purchasing additional solar panels—an encouraging sign of agency and commitment. As financial literacy and market engagement grow, women are better positioned to invest in clean energy solutions, reinforcing both the sustainability of the project and its climate mitigation goals.

4. Building Climate Resilience to Safeguard Carbon and Livelihood Gains

The long-term sustainability of salt production—and the carbon savings it enables—is increasingly at risk due to climate variability. Unpredictable rainfall, flooding, and high winds were consistently identified by women salt workers as major challenges, damaging infrastructure, disrupting operations, and intensifying their labor burden. These environmental shocks directly threaten both livelihoods and the continuity required for reliable emission reductions. Addressing this risk calls for targeted investment in climate-resilient infrastructure—such as elevated and reinforced salt pans, raised bunds, and



regulated water channels. These adaptations help stabilize production cycles and protect critical assets, thereby ensuring the consistency needed for verified carbon credit generation.

SEWA's efforts to secure institutional recognition of women salt workers as formal producers under clean energy and microenterprise programs are vital in this context. While progress is underway, continued advocacy is essential to fully realize this goal. Formal recognition would enable women to access government subsidies, technological upgrades, and structured market linkages. Embedding these measures into local governance systems can safeguard climate mitigation outcomes while strengthening women's roles as frontline leaders in climate adaptation



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1. Project Details

1.1. Summary Description of the Implementation Status of the Project

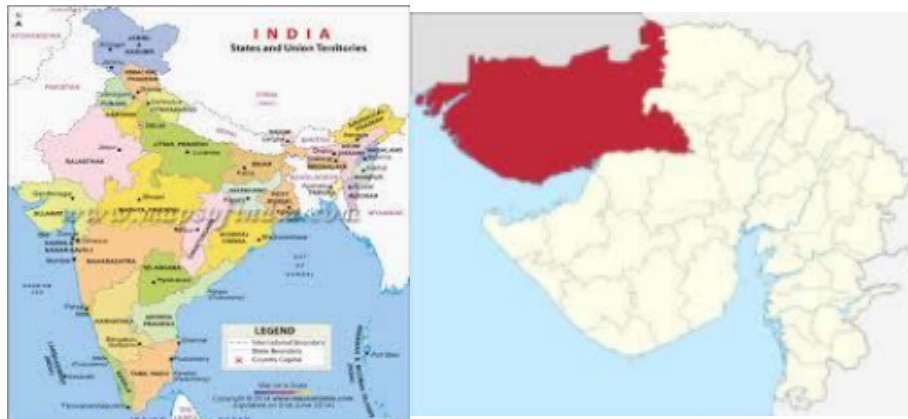
1.1.1. Location of the project

The project is located in the Little Rann of Kutch, Gujarat, India. The geographical coordinates of the Rann of Kutch are:

Latitude: 24° 05' 6.60" N

Longitude: 70° 38' 9.59" E

Map of India with Kutch region



1.1.2. Conditions prior to the project

Implementation

Located in Kutch region of Gujarat, the project aims to install solar PV systems for operating the water pumps used by salt farmers. The 'Agariyas' or salt farmers of the little Rann of Kutch produce more than 75% of India's salt. The area has dual characteristics of a wetland in June-September when it is submerged in rainwater as well as the water from the sea, and a dry season during which salt farming is practiced. Most of this water evaporates by the month of October, the beginning of the salt season. A crucial part of the salt farming process is the pumping of the brine from surface or underground sources into the salt pans; farmers generally use diesel for operating the pump. A salt farmer spends nearly a lakh rupees (~ 1,400 USD) annually, a significant portion of his/her earning, for procuring diesel. In this context, solar pumping has been identified as a desirable technological solution. The project involves the installation of solar panels that power the motor to pump water into the salt pans which is then left to evaporate, leaving behind salt deposits.



The project replaces traditional diesel-operated pumps with solar photovoltaic (PV) systems, which convert solar energy into the mechanical energy required to extract brine. The solar PV systems operate during daylight hours, with diesel generators used only as backup during emergencies or for extended pumping needs.

This intervention is categorized under Type I – Renewable Energy for the purpose of carbon credit generation and is being implemented by Value Network Ventures (VNV) in partnership with the Grassroots Trading Network for Women, an initiative of SEWA. The project contributes to climate change mitigation by displacing fossil fuel use, thereby reducing greenhouse gas (GHG) emissions, and aligns with co-benefit certification mechanisms under voluntary carbon markets.

The project start date is on 12th October, 2017 when the first batch of solar PV panels were purchased under the project. To date, a total of 1292 solar PV arrays has been installed. VNV conducted a measurement of the carbon emissions reduced using the Gold Standard methodology, and submitted a Monitoring Report.

Women are one of the key stakeholders in the project. The project aims to address SDG goal 5.5 to ensure women's full and effective participation and equal opportunities for leadership at all levels of decision making in political, economic and public life. The number of solar PV systems installed for women salt farmers in the Little Rann of Kutch in operation is 1292.

1.2. Project Developer

Organization name	Value Network Ventures Advisory Services Pte. Ltd
Contact persons	Sandeep Roy Choudhury Kasturi Navalkar Filip Tetaert
Title	Director Head, Partnerships Head, Land Sse
Address of Home Office and Field Office	41/1, Rayyan Towers, Church St , Bengaluru – 560001, Karnataka, India
Telephone	+ 91 9945662120
Email	sandeep@vnvadvisory.net; kasturi@vnvadvisory.net; filip@vnvadvisory.net

1.3. Other Entities Involved in the Project



Organization name	Grassroot Trading Network for Women (GTNW), SEWA
Role in the project	The GTNW plays a key role in the solar intervention for the women salt workers organised with SEWA , facilitating access to clean energy technologies, and supporting financial inclusion and market linkages
Contact person	Rehana Riyawala
Title	CEO, GTNW
Address	SEWA Reception Centre, Opp Victoria Garden, Bhadra, Ahmedabad, Gujarat, India 380001
Telephone	+919429619335
Email	rehanariyawala@sewa.org

1.4. Project Start Date

The solar pump project in Little Rann of Kutch, Gujarat, started in December 2017 and is currently ongoing.

1.5. Project Crediting Period

<i>W+ Domain and title of related activities</i>	<i>Start Date</i>	<i>End Date</i>	<i>Crediting period: Total Years/Months</i>	<i>Any Associated Standard (e.g. CDM, VCS)</i>
<i>Income & Assets</i>	<i>May 2025</i>	<i>May 2025</i>	<i>2 years</i>	<i>Gold Standard</i>
<i>Education & Knowledge</i>	<i>May 2025</i>	<i>June 2025</i>	<i>2 years</i>	<i>Gold Standard</i>

1.6. Title and Reference of W+ Methods

Measuring changes in women's **income, knowledge and education** generated through the implementation of the solar pump installation project.



2. Implementation Status

2.1. Implementation Status of Project Activities

The project started on 12th October 2017, when the first batch of solar PV panels were purchased under the project. To date a total of 1292 solar PV has been installed with further expansion currently underway.

2.2. Where applicable, describe how non-double counting measures are being implemented.

NA

2.3. Where applicable, describe how non-permanence risk factors are being monitored and managed.

NA

2.4. Methodology Deviations

There were no method deviations

2.5. Project Description Deviations

NA

3. Data and parameters

3.1. INCOME & ASSETS DOMAIN

3.1.1. Data and Parameters Available

Data / Parameter	Number of women beneficiaries
Data unit	Women beneficiaries of the carbon project
Qualitative data	NA
Description	Number of women benefiting from installation of solar pumps
Source of data	Project document and discussion with SEWA
Justification of choice of data or description of measurement methods and procedures applied	The sample size parameters are as follows: • Beneficiary population = 1292 • Assumed proportion= 50% • Level of acceptable error = 10% • Level of significance= 90% • Sample size= 70
	The purpose of the data was to establish the increase in income of women salt workers who had installed the solar pump for salt production.



Comments	NA
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3.1.2. Data and Parameters Monitored

Indicator	Average Gross Annual Income
Data unit(s)	Increase in gross annual income from sale of salt
Description	Established by comparing change in gross annual income of women salt workers from sale of salt before and after the installation of solar pumps.
Source of data	Survey
Description of methods to collect information and procedures to be applied	Trained enumerators collected the data using the survey questionnaires. Surveys were conducted by trained enumerators from 29 th April till 5 th May 2025.
Purpose of the data	This corresponds to the Income & Assets formula
Comments	NA

3.2. EDUCATION & KNOWLEDGE DOMAIN

3.2.1. Data and parameters available

Data / Parameter	Total number of women beneficiaries
Data unit	Women beneficiaries of the carbon credit project
Qualitative data	NA
Description	Number of women beneficiaries of the project is 1292
Source of data	Survey
Justification of choice of data or description of measurement methods and procedures applied	The sample size parameters are as follows: • Beneficiary Population = 1292 • Assumed proportion = 50% • Level of acceptable error = 10% • Level of significance = 90% • Sample size= 70



Purpose of the data	The purpose of the data was to establish the changes in knowledge retention and use by beneficiaries before and after the installation of solar pumps
	NA
Indicator	Level of confidence to remember the contents of the trainings on - solar installation, use (moving panel based on sun) and maintenance
Data unit	<i>Level of confidence</i>
Description	Education and knowledge retention from training inputs/interventions
Source of data	Survey
Description of methods to collect information and procedures applied	Trained enumerators collected the data using the survey questionnaires. Surveys were conducted by trained enumerators from 29 th April till 5 th May 2025.
Purpose of the data	This corresponds to the Education & Knowledge formula
Comments	NA

Indicator	Confidence in approaching multiple traders in salt trade before the project intervention Confidence in applying for loans before getting loans for solar panel
Data unit	<i>Knowledge application</i>
Qualitative data	NA
Description	Behavioral changes as a result of the training interventions
Source of data	Survey
Description of methods to collect information and procedures applied	Trained enumerators collected the data using the survey questionnaires. Surveys were conducted by trained enumerators from 29 th April till 5 th May 2025.
Purpose of the data	This corresponds to the Education & Knowledge formula
Comments	NA



Indicator	Ability to explain the technical trainings on solar pumps received Ability to explain the terms of conditions of loans
Data unit	Analytical ability
Qualitative data	NA
Description	Challenges women faced in the application of the education/knowledge
Description of methods to collect information and procedures applied	Trained enumerators collected the data using the survey questionnaires. Surveys were conducted by trained enumerators from 29 th April till 5 th May 2025.
Purpose of the data	This corresponds to the Education & Knowledge formula
Comments	NA

Indicator	Confidence to train others on solar pumps installation and maintenance Confidence to share information to others on how to access loan for solar pumps
Data unit	Synthesis ability
Qualitative data	NA
Description	Challenges women faced in the application of the education/knowledge
Description of methods to collect information and procedures applied	Trained enumerators collected the data using the survey questionnaires. Surveys were conducted by trained enumerators from 29 th April till 5 th May 2025.
Purpose of the data	This corresponds to the Education & Knowledge formula
Comments	NA

Indicator	Key challenges in salt production using solar pumps
Data unit	Challenges
Qualitative data	NA



Description	Challenges women faced in the application of the education/knowledge
Description of methods to collect information and procedures applied	Trained enumerators collected the data using the survey questionnaires. Surveys were conducted by trained enumerators from 29 th April till 5 th May 2025
Purpose of the data	This corresponds to the Education & Knowledge formula
Comments	NA



3.2.2. Data and parameters Monitored (Same as above)

There were no changes in the data and parameters available and those that were eventually monitored.

3.2.3. Monitoring plan

Results	Indicators	Risks – including Do No Harm risks	Means of verification	Collection methods	Frequency	Responsibility
<i>End outcome (Long term)</i>						
<i>Intermediate outcome (Medium Term)</i>						
Immediate outcome - Increased income & assets - Increased knowledge - Better Health and well being	- Increased income and assets - Conversion of income to assets - Increased knowledge - Decrease in expenditure on health/less case of skin and other diseases	- Income gains might be unstable in case of volatile market salt price/unstable market - Increased income might be still controlled by male members reducing women's financial autonomy - With more knowledge and skills, women maybe burdened with additional roles without support	Survey results SEWA income data	Survey	NA	W+ Team
Outputs - Installation of solar pumps - Women supported to access loans/subsidies - Training on techniques to improve salt yields - Training on maintenance and repair of solar units - Access to marketing Linkages	1292 women accessed solar pumps 1292 women trained in maintenance and repair of solar units 1292 women access subsidy/loans					



3.2.4. Do No Harm Indicators

Indicators	Increase in financial distress
Question	Have you had to sell assets (jewellery, livestock, etc.) or get a loan in order to pay for solar?
Indicator	Increase in children assisting in salt work
Questions	Have you had to employ your children below age 14 yrs in salt work? Have the children had to drop out of school?
Indicator	Incidence of physical, emotional, or relational harm reported by women linked to changes in income, asset control, or decision-making power within the household
Questions	Has increase in income or assets led to any physical or emotional abuse, social sanctions, violence, or marital troubles? Are you able to negotiate the prices and terms of salt sales with traders?

4. RESULTS

4.1. INCOME & ASSETS DOMAIN

4.1.1. Current performance

W+ Domain	Income & Assets
Indicator	Increase in gross annual income from sale of salt after installation of solar pumps
Description	Income and assets increased by 240% post project intervention
Situation	The installation of solar energy systems led to a 67.7% increase in salt production and a more than 240% rise in gross annual income. Operational costs dropped significantly, with diesel pump use reduced by 71.4%, diesel consumption by 66.7%, and seasonal energy expenditure nearly halved. These changes substantially improved net income, showing that the solar intervention enhanced both profitability and sustainability in salt production.
Prospects	Looking ahead, there is strong potential to boost community resilience and livelihoods through an integrated approach that addresses energy poverty—a key barrier in salt production. Leadership training for collective



	action can build local capacity for sustainable resource management. Integrating the solar electrification project into the program would not only raise household earnings but also provide clean, reliable energy, reducing dependence on costly fuels. Access to better water management and climate-smart agriculture will further strengthen food security and climate resilience. Together, these interventions offer a clear pathway to sustainable, inclusive development. It is highly recommended that the project be scaled out to benefit the 5000 women salt workers in the LRK region of Gujarat.
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4.1.2. Calculation of the percentage of change

Sample size

The sample size for the survey was 70¹, which included beneficiaries from the following villages spread across Surendranagar district in the LRK region of Gujarat as mentioned in Table 1 below.

Sampling frame

The sample size was calculated in compliance with the general guidance on sampling by UNFCCC/CCNUCC for project activities and program of activities (version- 02.0).²

Table 1: Sampling detail for Income & Assets domain

Name	Freq.	Percent
Juna Kuda	11	15.71
Nava Kuda	6	8.57
Koparni	4	5.71
Enjar	11	15.71
Kidi	6	8.57
Nimaknagar	2	2.86
Mangadh	7	10.02
Tikkar	13	18.57
Vennasar	10	14.28
TOTAL	70	100

¹ The sample size required (as per level of confidence and acceptable error stated above)was 68, but we covered 70 respondents

² http://cdm.unfccc.int/Reference/Guidclarif/meth/meth_guid48.pdf



4.1.3. Calculation of W+ Income & Assets Credits

The total increase in income and assets for women benefiting from the installation of the solar pumps in LRK region is calculated by comparing the increase in the gross annual income³ pre and post installation.

Table below shows the gross annual income of the beneficiaries. The average income of the beneficiaries increased from INR 162,864 to INR 553,993.

Table 2: Average monthly income of beneficiaries before and after project intervention

Household Type	n	Average Gross Annual Income (INR)
Beneficiary After	70	553,993
Beneficiary Before	70	162,864

Calculation of Percent of Change

W+ Credit Calculation

Table 3: Average monthly income of beneficiaries before and after project intervention

Household Type	n	Average Gross Annual Income (INR)
Beneficiary After	70	553,993
Beneficiary Before	70	162,864

Table 4: W+ credit generation

Income change and saving change (Beneficiary income after - Beneficiary income before)	391,129
Percentage Change from baseline (Beneficiary income after - Beneficiary income before) / Beneficiary income before	240.2%
Total beneficiaries (Wc,p)	1,292
Total W+ credits (=Wc,p * % change)	310,338
Final W+ Credits (Every 10% change is 1 W+ credit) [=Total W+ credits * 0.1]	31,034

³ For the purpose of calculating the change in income, nominal income data was adjusted to reflect real income change. As the exact pre-intervention year was not specified, 2016 was assumed as the baseline (given the project's initiation in 2017). Using an average inflation rate of 5%, the estimated gross annual change in income is approximately 122% in real terms.



Data collected from women salt workers (see Appendix for details) was analyzed to assess the impact of solar energy system installation. The findings show a significant improvement in both gross and net incomes, with gross annual income increasing by over 240%, largely due to a 67.7% rise in salt production enabled by more efficient and reliable energy. Operational costs declined sharply, with diesel pump use reduced by 71.4%, diesel consumption by 66.7%, and seasonal energy expenditures nearly halved. These combined effects demonstrate that the solar intervention not only enhanced earnings but also made salt production more cost-effective and environmentally sustainable.

4.2. Knowledge & Education

4.2.1. Current performance

W+ Domain	<i>Education & Knowledge</i>
Indicator	Recalled, applied, analysed and synthesized knowledge and skill sets acquired through technical training on solar installation, maintenance, financial inclusion and market negotiation
Description	The Knowledge score improved by 184.6%
Situation	The intervention has led to notable improvements in multiple areas for women salt workers, including increased confidence in handling solar technology, better financial literacy, enhanced market negotiation skills, and greater mobility and participation in public spaces. Collective action through SEWA has empowered women to access better prices for their salt, understand loan terms. However, some challenges remain. Access to financial resources still continues to be a barrier for 62% of women, and full financial autonomy is still evolving, with many relying on male family members or SEWA representatives for banking interactions. While work burdens and mobility have improved, deep-rooted gender norms still influence women's roles in market leadership and independent financial decision-making.
Prospects	Building on the progress made, there is strong potential to deepen women salt workers' empowerment through targeted interventions. Expanding access to inclusive financial services and strengthening financial literacy can enhance autonomy, while leadership and market negotiation training can help women take on more prominent roles in collective and individual bargaining. Scaling peer-led solar training programs offers an opportunity to institutionalize women's technical leadership. Additionally, addressing environmental challenges remains critical. The improved time availability due to solar technology



	also opens pathways for skill development and income diversification. Formalizing women's collectives and linking them with government schemes can ensure long-term sustainability and institutional recognition, enabling a more equitable and resilient salt production ecosystem.
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The project provided technical trainings on solar based salt production, and maintenance improved yield of salt, and provided marketing linkages through the RUDI Multi Trading Company collective of farmers organised with SEWA

4.2.2. Calculation of the percent of change

Sample size

The sample size for the survey was 70.

Sampling framework

Sample size was calculated in compliance with the general guidance on sampling by UNFCCC/CCNUCC for project activities and program of activities (version- 02.0).⁴

The sampling detail is same as mentioned in the Income domain

4.2.3. Calculation of W+ Education & Knowledge credits

For the Education & Knowledge calculation, knowledge, behaviour and challenge scores are variables considered. The percent change is calculated by comparing average knowledge score for beneficiaries pre and post intervention.

Table 5 : Average knowledge score before and after project

Respondent type	Average knowledge score before and after project intervention		
	n	Mean	Std. Dev.
After project	70	43.9	6.3
Before project	70	15.4	8.3

Table 6: W+ credit calculation detail

Change in Knowledge score(After project score -Before project score)	28.5
Percentage Change = (After project score -Before project score)/Before project score	184.6%
Total beneficiaries (Wc,p)	1292

⁴ http://cdm.unfccc.int/Reference/Guidclarif/meth/meth_guid48.pdf



Total W+ units (=Wc,p *% change)	238,542
Total W+ Credits (Every 10% change is 1 W+ Credit) [=Total W+ credits *0.1]	23,854

The results depict that the change in composite knowledge score for beneficiary households is 28.5, depicting an increase of 184.6% in knowledge retention, use, analysis and synthesis as compared to pre-intervention.

The intervention has led to notable improvements in multiple areas for women salt workers in the LRK region, including increased confidence in handling solar technology, better financial literacy, access to market negotiation skills, and greater mobility and participation in public spaces. Collective action through SEWA has empowered women to access better prices for their salt, understand loan terms, and even train others in solar-based salt production. However, some challenges remain. Access to financial resources continues to be a barrier for 62% of women, and full financial autonomy is still evolving, with many relying on male family members or SEWA representatives for banking interactions. Environmental challenges such as water scarcity, climate impacts like flooding and unseasonal rains, and poor management of fresh water canal releases in the sanctuary area persist. While work burden and mobility have improved, deep-rooted gender norms still influence women's roles in market leadership and independent financial decision-making. These findings highlight both the substantial gains achieved and the need for continued support to address structural and environmental barriers.



1. APPENDIX

1. Income & Assets Domain:

1.1. Income Generation & Saving

The installation of solar energy systems has brought about a positive shift in the livelihoods of salt producers, leading to substantial improvements in both gross and net incomes. Gross annual income increased by over 240%, primarily driven by a 67.7% rise in salt production and increase in the number of days of salt production. Beyond economic gains, the shift to solar has reduced dependence on costly and polluting fossil fuels, making salt production more sustainable and environmentally friendly. The intervention has not only improved profitability for producers but also laid the foundation for a cleaner, more resilient, and equitable production system.

Table 7: Average monthly income of beneficiaries before and after project intervention

Household Type	n	Average Gross Annual Income (INR)
Beneficiary After	70	553,993
Beneficiary Before	70	162,864

Table 8: Change in water pumping situation after installation of solar pumps

	n	%
Increased hours of operation	70	100%
Reduced Cost	70	100%
More reliable	58	83%
Better salt crystallization	66	94%

Table 9: Increase in number of salt farming days because of the solar pumps

	n	%
Yes	67	96%
No	3	4%

This growth is attributed to the availability of more efficient, reliable, and uninterrupted solar-powered energy, which has significantly enhanced productivity. Simultaneously, operational costs have declined sharply—diesel pump usage dropped by 71.4%, diesel consumption by 66.7%, and seasonal energy expenditure was nearly cut in half. These notable reductions in input costs, when combined with increased output, have resulted in a considerable boost in net income.

**Table 10: Average hours of pump operation, diesel use, salt production and income before and after solar installation**

	n	Before	After	% Change
Average hours of diesel pump operation per day	70	21	6	↓ - 71.4%
Barrels of diesel use per day	58	9	3	↓ - 66.7%
Total salt production per year (in tons)	70	859	1441	↑ 67.8%
Average seasonal (October–May) energy expenditure	70	102729	53143	↓ - 48.3%
Average annual income from salt production (in INR)	70	162864	553993	↑ 240.2%

1.2. Perceived Increase in Economic Resilience

The majority of respondents—**57%**—reported a **significant increase** in their overall well-being, livelihood opportunities, or economic resilience as a result of the intervention. These women highlighted notable improvements across multiple domains, including income stability, energy access, reduced drudgery, and greater confidence in managing salt production independently. For many, the transition to solar energy and participation in collective action platforms through SEWA enabled a fundamental shift in their role from informal labourers to informed producers and negotiators in the salt value chain.

Meanwhile, **43%** of respondents indicated that while there has been a **slight increase**, the change has been more gradual or partial in nature. These women acknowledged improvements in areas like reduced energy costs and time savings but pointed to continuing challenges—such as limited access to financial resources, lack of full ownership over decision-making, or male domination over market negotiations—as factors slowing the pace of transformation in their lives.

Together, these findings suggest that the intervention is broadly effective in creating positive change, but also highlight the importance of continued support to ensure **equitable, inclusive, and deeper impacts** across all segments of the community.

Table 11 : Increase in income after solar pump installation

	n	%
Significantly increased	40	57%



Slightly increased	30	43%
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Table 12: Main benefits after installing the solar pump

Benefits	n	%
Reduced fuel cost	70	100%
Longer pumping hours	68	97%
Better quality salt	66	94%
Less machine maintenance	66	94%
Environmental benefits no diesel emissions	63	90%
Others	2	3%

1.3. Primary Livelihood Patterns and Persistent Trade Dynamics

As is evident from the table below, salt production remains the primary source of livelihood for the majority of the women salt workers, engaging them for approximately 6 to 8 months each year. During the remaining months, most women supplement their income by working as agricultural or casual laborers in and around their villages. While the project intervention has successfully facilitated a shift in ownership and active engagement of women in salt production—promoting greater agency and technical participation—the overall trade dynamics appear to have shifted only marginally. **Only 37%** of the respondents reported a significant change in trade practices or market control. This suggests that while women have gained visibility and confidence in production and operations, and better access to salt traders, the broader market structure and control over trade and pricing remain largely unchanged, still influenced by traditional intermediaries and male-dominated networks. This highlights the need for further interventions aimed at disrupting entrenched market hierarchies and strengthening women's role in trade negotiations and distribution channels.

Table 13: Decision making after project intervention

	Level of decision [1= Lowest, 5= Highest, NA= Not Applicable]					
	1	2	3	4	5	NA
Decision on Income Salt farming	3%	1%	36%	21%	37%	1%
Decision on the Income from wage labour	1%	16%	11%	57%	0%	14%
Decision on Income from share cropping	0%	7%	1%	3%	0%	89%
Decision on Non-farm activities: Salt business trade	1%	4%	4%	9%	0%	81%



Decision on income from Solar motor repair and maintenance	0%	13%	9%	16%	0%	61%
Decision on income from Business or trading	1%	21%	3%	7%	0%	67%
Decision on income from traditional crafts	0%	0%	0%	1%	0%	99%
Decision on income from farming	3%	9%	7%	17%	0%	64%

Table 14: Causes for Increase in income from salt sales

	n	%
Better market price	61	87%
new markets multiple markets options	45	64%
Increased production due to ground water increase	57	81%
Less diesel	66	94%
collective marketing	37	53%
producing industrial salt from edible salt	34	49%
better negotiation skills	45	64%
reduced rate of interest	13	19%
Use of solar	57	81%
Mechanization of loading of salt post production process	43	61%
Reduced maintenance cost self-repair	40	57%
sale of by-products magnesium chloride and calcium	17	24%
OTHER specify	1	1%

A significant majority (87%) reported achieving better market prices for their salt, reflecting both improved product quality and enhanced negotiation capabilities. In fact, 64% of respondents noted that their market access had expanded, with new and multiple market options becoming available. This diversification of market channels is closely linked to the 53% who attributed gains to collective marketing strategies, which have empowered women to bargain from a position of strength.

On the production front, 81% of women reported increased salt output, largely due to improved access to groundwater and the efficient use of solar-powered pumps. The shift from diesel to solar has been transformative: 94% reported reduced diesel dependency, while 81% emphasized the role of solar energy in streamlining their operations. This transition has not only improved environmental sustainability but also lowered operational costs—57% highlighted a reduction in maintenance expenses due to their ability to self-repair solar systems.

Innovation in production processes is also gaining momentum. About 49% of the respondents shared that they are now producing industrial salt from what was previously limited to edible salt. Additionally, 61% reported the adoption of mechanized loading systems post-production, further easing labor-intensive tasks.

Financially, while only 19% reported access to reduced interest rates on loans, the overall trend points toward a growing financial literacy and inclusion, especially through SEWA-



facilitated access to banking and credit. Furthermore, 24% of women have begun to generate income from by-products such as magnesium chloride and calcium, indicating emerging pathways for diversification and value addition.

In summary, the integrated intervention has not only improved the economic outcomes for women salt workers but also strengthened their technical skills, market presence, and confidence in managing their enterprises. However, continued support is essential to expand access to fair credit, promote value-chain development, and deepen women's leadership in trade and production.

1.4. Financial Empowerment Among Women Salt Workers

The financial benefits from the solar-based salt production and associated interventions have not only increased the incomes of women salt workers but also enabled them to make purposeful and diversified use of their earnings. The survey reveals a significant shift in how these women are directing their income—towards both immediate household needs and long-term asset creation—demonstrating growing financial agency and decision-making power.

A remarkable 89% of the women reported investing their earnings in building or renovating their homes. This reflects a prioritization of living standards, safety, and stability for their families. Similarly, 71% used their income to purchase vehicles such as scooters, motorcycles, or tractors, signifying improved mobility, reduced dependency, and greater autonomy in both personal and work-related travel.

Daily sustenance and family well-being were also prominent areas of expenditure. About 73% of respondents reported using their income for food consumption, and 70% invested in their children's education—an indicator of long-term vision and commitment to breaking the cycle of poverty. Healthcare, though still a challenge, was covered by 41% of the women using their own earnings, showing that improved income is translating into better access to medical care.

Significantly, 61% of the women reported reinvesting in solar technology—such as purchasing new solar panels—highlighting their confidence in sustainable, low-cost energy as the foundation of their economic activity. Additionally, 54% chose to reinvest in other income-generating businesses, illustrating a growing entrepreneurial mindset.

While 31% of the respondents used income for loan repayment, only 39% reported building savings at home or in informal savings groups—indicating that while income use is purposeful, there is still room to strengthen formal financial inclusion and saving behaviors. A small but notable portion (33%) invested in buying land, and 50% reported using funds for their children's marriages, showing how financial empowerment is supporting both economic security and social responsibilities.

Other common uses of income included purchasing clothing (76%), mobile phones (39%), and jewelry (34%), suggesting improvements in self-esteem, connectivity, and asset



ownership—particularly important for women whose access to such resources was traditionally limited.

Overall, these findings reveal a promising trend: income earned through solar-powered salt production is being channelled into meaningful areas that improve quality of life, economic security, and future resilience. Continued support in financial literacy, access to formal banking, and scalable income-generation opportunities will be essential to deepen this trajectory of empowerment and inclusive development.

Table 15: Spending pattern of additional income and savings from salt production

	n	%
Loan Repayment	22	31%
Buy land	23	33%
Building house renovating house	62	89%
Scooter, motorcycle, tractor	50	71%
Re-invest in income-generation business	38	54%
Education	49	70%
Daily food consumption	51	73%
Buying new solar panel	43	61%
Clothes	53	76%
Mobile	27	39%
Medical expenses	29	41%
Jewelry	24	34%
Marriage of children	35	50%
Savings home bank	27	39%

1.5. Women's Agency and Well-being

The introduction of solar-based salt production, along with complementary training, financial inclusion, and collective mobilization through SEWA, has had impacts beyond increased incomes and productivity. The survey findings reflect a substantial enhancement in women's personal agency, household participation, and community visibility—signifying a broader transformation in gender dynamics and social empowerment.

A resounding 84% of the women reported having increased input into household decisions—a strong indicator that their financial contributions and expanded roles in productive activities have led to greater respect and influence within their families. This influence extends into the public sphere, with 59% indicating that they now have improved access to and involvement in community-level decisions, which is a positive shift but also indicates that there barriers still exists particularly in local governance. This shift demonstrates growing recognition of women as active agents of change in both domestic and communal contexts.



Mobility, historically a constraint due to cultural norms and safety concerns, has also shown marked improvement. 70% of women reported increased freedom to move outside the home, participate in group meetings, and access markets—paving the way for greater participation in economic and civic life.

Economic empowerment has translated into strategic reinvestment: 63% of women are putting earnings back into businesses and productive ventures. This signals a shift from subsistence to growth-oriented behaviour, showing long-term thinking and entrepreneurial engagement. Alongside, 87% of respondents noted significant time savings since the transition to solar, largely due to reduced physical labor and the reliability of solar pumps. This newfound time has had ripple effects across well-being indicators.

Notably, 83% reported improved health outcomes—tied to reduced exposure to diesel fumes and physical strain. 80% of the women said they now enjoy more discretionary time, and 90% reported having leisure time—an often overlooked but vital indicator of quality of life and mental well-being. These aspects reflect a reduction in work burden and a more balanced life.

When it comes to financial autonomy, only 47% of the women reported having their “own money”—resources they control independently, suggesting that more than half still lack financial autonomy. This independence also shapes decisions related to children: 64% of the women are involved in making educational decisions for their children, while 36% report direct improvements in child welfare due to better income, nutrition, and stability.

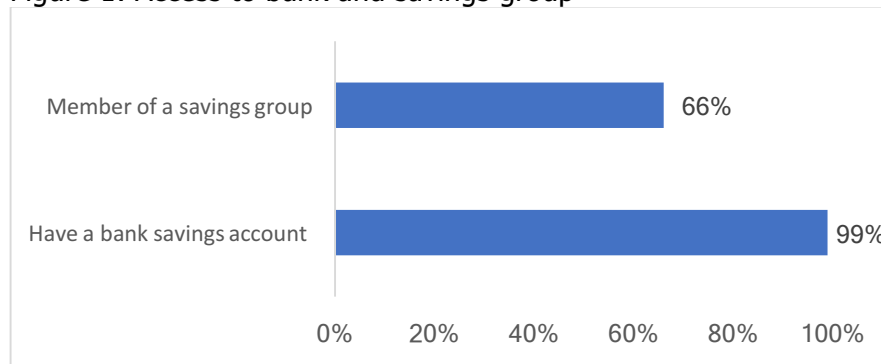
Together, these data points paint a compelling picture of transformation: the intervention is not only changing how women work, but how they live, lead, and dream. By strengthening their voices in both household and public domains, enabling financial independence, and improving health and time balance, the project is laying a strong foundation for sustained gender equity and resilient communities.

Table 16: Benefits from salt production



Increased input into household decisions	59	84%
Increased access to community decisions	41	59%
Increased mobility outside the household	49	70%
Reinvesting in business productive activities	44	63%
Timesaving	61	87%
Health	58	83%
Well-being discretionary time	56	80%
Leisure	63	90%
Own money	33	47%
Decision making related to children education	45	64%
Improved child welfare	25	36%

Figure 1: Access to bank and savings group





2. KNOWLEDGE RETENTION, ANALYSIS AND USE

1. Increased Technical Confidence and Financial Inclusion:

The intervention has led to a marked improvement in women's technical confidence and financial literacy. During the survey, 94% of the beneficiaries reported feeling confident in regularly applying the technical knowledge they gained, particularly in the installation, monitoring, and maintenance of solar panels. Notably, many women emphasized that they were initially hesitant and lacked confidence, but are now independently managing the upkeep of solar pumps, a task traditionally dominated by men. This shift underscores the success of targeted technical training and the empowerment-focused design of the project.

In addition to technical skills, the intervention has facilitated enhanced women's engagement in market and financial systems. 73% of salt workers reported better access to salt traders and an improved ability to negotiate prices, largely due to the collective marketing approach facilitated by SEWA. This has strengthened their bargaining power within a supportive network.

Furthermore, there has been a notable advancement in financial inclusion. Prior to the intervention, only 13% of the women understood the terms and conditions of loan repayment. Post-intervention, that figure has increased to 73%, with women expressing confidence in managing loans and financial responsibilities. Many have now been able to avail loans in their own names, a significant step toward financial independence and decision-making power. These developments reflect clear, positive outcomes in both financial capability and economic agency for women salt workers.

Table 17: Recall of knowledge

Before project intervention (N=70)	n	%
Level of confidence in terms of remembering the key terms of the technical trainings you ever participated		
Not Confident	51	73%
Somewhat Confident	7	10%
Confident	12	17%
After Project intervention		
Level of confidence to remember the contents of the trainings on - solar installation, use (moving panel based on sun) and maintenance?		
Not Confident	1	1%
Somewhat Confident	3	4%
Confident	66	94%

2. Market Access, Financial Inclusion, Technical Empowerment, and Peer Leadership:



As per the survey results, the intervention has brought about significant improvements in market access, financial inclusion, technical competence, and peer-led knowledge dissemination among women salt workers.

Table18: Market access, financial literacy and technical training

Before project intervention (N=70)	Yes	
	n	%
Were you able to access different salt traders before the use of solar project?	4	6%
Aware of the loan terms and conditions (you may have taken before solar loan)	9	13%
After Project intervention		
Market linkages - Access to salt traders	65	93%
Remember the contents of the trainings on solar panel loan terms and conditions	51	73%

A key outcome has been the dramatic rise in market negotiation skills among participants. Prior to the intervention, only 6% of women reported being able to negotiate better prices for their salt. After the implementation of SEWA's collective bargaining approach, this figure rose sharply to 93%, reflecting a substantial improvement in their ability to access salt traders (this does not necessarily mean that they have access to better prices and therefore better income). This empowerment in market dealings has enabled women to play a more active role in price setting, challenging long-standing market inequities.

In tandem, the initiative also greatly enhanced access to salt traders, with 73% of women salt workers reporting improved trader engagement and better pricing outcomes. These results underscore the effectiveness of collective marketing strategies in elevating women's economic agency.

Financial inclusion has also advanced notably. Before the project, only 13% of women understood the terms and conditions of loan repayment, while 81% admitted to having little or no knowledge of loan processes. Through the intervention, women were able to access credit in their own names to purchase solar pumps—an unprecedented shift in financial independence for many. As a result, 73% of participants now report understanding loan conditions, with 67% expressing confidence in managing their loans and 31% indicating moderate confidence. However, field observations suggest that while awareness has increased, full financial autonomy is still developing, as some women continue to rely on male family members or SEWA representatives during formal financial negotiations.

Table 19: Knowledge on T&C of loans

Before (N=70)	After (N=70)
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Explain the terms and conditions of the loan process.			Explain the terms and conditions of the loan for solar?		
Level of confidence	n	%	Level of confidence	n	%
Not Confident	57	81%	Not Confident	1	1%
Somewhat Confident	8	11%	Somewhat Confident	22	31%
Confident	5	7%	Confident	47	67%

As evident from the data presented below, access to banks and formal loans has significantly enhanced the financial awareness and confidence of women salt workers. The shift is particularly notable in the fact that each woman now holds a personal bank account, and the solar pump loans were issued in their own names. This direct financial engagement has not only increased their practical knowledge about loan processes but also fostered a greater sense of financial ownership and empowerment. Before the intervention, 89% of the women reported having no confidence in dealing with banks or understanding how to access financial services. Following the intervention, 69% of the women stated they now feel confident in navigating the process of securing loans for solar pumps. This transformation illustrates a critical step forward in advancing women's financial inclusion and autonomy in traditionally male-dominated financial spaces.

Table 20: Knowledge on loans/banking

Before (N=70)			After (N=70)		
How confident were you in applying for loans before solar loans?			How confidently can you explain how to get a loan for solar?		
Level of confidence	n	%	Level of confidence	n	%
Not Confident	62	89%	Not Confident	0	0%
Somewhat Confident	6	9%	Somewhat Confident	22	31%
Confident	2	3%	Confident	48	69%

On the technical front, there has been a rise in women's confidence and capability. Prior to the initiative, 59% of women reported confidence in handling diesel pumps and motors, often viewed as complex and physically demanding. Following the introduction of solar-powered systems—deliberately designed to be more accessible and aligned with women's needs—97% of women now report high confidence in the use and maintenance of the systems, with the remaining 3% reporting moderate confidence.

Table 21: Confidence in technical handling of salt production

Before (N=70)	After (N=70)
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I could explain the proper use of the diesel machines pumps, motors etc			How confidently can you apply your knowledge to explain and clean the solar panels		
Level of confidence	n	%	Level of confidence	n	%
Not Confident	11	16%	Not Confident	0	0%
Somewhat Confident	18	26%	Somewhat Confident	2	3%
Confident	41	59%	Confident	68	97%
How confidently could you explain how to use the diesel machines?			How confidently can you apply your knowledge to install the solar?		
Level of confidence	n	%	Level of confidence	n	%
Not Confident	5	7%	Not Confident	4	6%
Somewhat Confident	25	36%	Somewhat Confident	10	14%
Confident	40	57%	Confident	56	80%
How confident were you in using the diesel machines?			How confidently can you apply your knowledge to use the solar?		
	n	%		n	%
Not Confident	5	7%	Not Confident	1	1%
Somewhat Confident	24	34%	Somewhat Confident	3	4%
Confident	41	59%	Confident	66	94%
How confidently could you explain how to use the diesel machines?			How confidently can you apply your knowledge to install the solar?		
Level of confidence	n	%	Level of confidence	n	%
Not Confident	5	7%	Not Confident	4	6%
Somewhat Confident	25	36%	Somewhat Confident	10	14%
Confident	40	57%	Confident	56	80%
How confident were you in using the diesel machines?			How confidently can you apply your knowledge to move the solar?		
	n	%		n	%
Not Confident	5	7%	Not Confident	1	1%
Somewhat Confident	24	34%	Somewhat Confident	3	4%
Confident	41	59%	Confident	66	94%

Importantly, the impact of the intervention has extended beyond individual application to peer leadership and knowledge-sharing. The survey revealed that 94% of women feel confident in independently training others—including relatives and neighbors—in solar-based salt production. This not only strengthens the sustainability of the intervention but also indicates the emergence of women leaders and peer educators within the community.

Table 22 : Application of knowledge for wider use

Before (N=70)	After (N=70)
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I could train my family/friends/neighbours on how to use diesel machines (pumps/motors) for salt farming.			Based on my present knowledge, I can train my family/friends/neighbours on how to use solar for salt farming.		
Level of confidence	n	%	Level of confidence	n	%
Not Confident	11	16%	Not Confident	0	0%
Somewhat Confident	26	37%	Somewhat Confident	4	6%
Confident	33	47%	Confident	66	94%
I could provide information to my family/friends/neighbours on how to get a loan for general purpose before SEWA support			Based on my present knowledge, I can train my family/friends/neighbours on how to get a loan for solar.		
Level of confidence	n	%	Level of confidence	n	%
Not Confident	50	71%	Not Confident	0	0%
Somewhat Confident	7	10%	Somewhat Confident	24	34%
Confident	13	19%	Confident	46	66%

Together, these outcomes reflect a transformative shift in women's roles—from passive recipients to active producers, negotiators, and trainers—laying the foundation for sustained economic empowerment and community resilience.

3. Contending with Challenges

a. Family Support and Social Acceptance

Initially, a lack of support from family members posed a significant barrier to women's participation in salt production and public activities. In the survey, 64% of respondents identified this as a major challenge, reporting that they were discouraged or not allowed by their families to be active in public spaces, including attending SEWA meetings or participating in collective activities. However, this situation has changed dramatically. Currently, only 10% of women still face such restrictions, while 66% stated that lack of family support is now the least of their challenges, citing strong encouragement from husbands and elders to take active roles in both salt production and women's collectives. Many women shared that their families now actively encourage them to attend SEWA meetings, recognizing the personal and economic growth opportunities they offer. Some even noted that their family members "push" them to participate, believing it helps them gain confidence and leadership skills. This shift highlights a broader transformation in gender norms and family dynamics, where women's economic participation is increasingly supported and valued within their households and communities.

b. Improved Time Management and Ongoing Financial Challenges

The shift from diesel to solar-powered pumps has brought significant improvements in time management for women salt workers. **64% of women reported having more time available** since the installation of solar pumps. Unlike diesel systems, which required constant manual adjustments, regular monitoring, and physically demanding labor, the solar-powered systems are more autonomous and reliable. This has reduced the need



for women to be present in the salt fields all day, allowing them to balance their domestic responsibilities more effectively.

Many women shared that, previously, they had to carry their young children with them to the worksite due to the long hours required to manage diesel pumps. With the solar systems in place, they can now return home earlier, cook for their families, care for their children, and even participate in community or SEWA meetings. This shift has not only improved their quality of life but also enabled greater participation in personal and community development activities.

However, despite this progress, access to financial resources remains a significant challenge. While there has been a notable improvement in financial inclusion, respondents still identified limited access to credit or financial support as a major barrier. This indicates that while solar technology has eased time burdens and enabled better work-life balance, more targeted efforts are needed to ensure women have the financial means to invest in and expand their economic activities.

Table 23: Key challenges/obstacles to grow your salt production using solar

	Before (N=70)	After (n=70)
Lack of support from family members		
Highly Challenging	64%	10%
Moderately Challenging	23%	24%
Least challenging	13%	66%
Access to financial resources		
Highly Challenging	93%	16%
Moderately Challenging	4%	46%
Least challenging	3%	39%
Breakdown of solar machinery due to excessive heat		
Highly Challenging	81%	39%
Moderately Challenging	13%	37%
Least challenging	6%	24%
Family members actively discourage your taking public role		
Highly Challenging	63%	6%
Moderately Challenging	24%	17%
Least challenging	13%	77%
Balancing conflicting interests of home and work eg time limitations,		
Highly Challenging	83%	9%
Moderately Challenging	7%	27%
Least challenging	10%	64%
Sufficient ground water for salt production		
Highly Challenging	81%	39%
Moderately Challenging	17%	33%
Least challenging	1%	29%
Salt related ill health sickness		
Highly Challenging	81%	29%
Moderately Challenging	17%	47%



Least challenging	1%	24%
Climate change flooding, windstorms, unseasonal rain		
Highly Challenging	97%	67%
Moderately Challenging	3%	29%
Least challenging	0%	4%
Release of fresh water from the canal forest management		
Highly Challenging	89%	77%
Moderately Challenging	10%	14%
Least challenging	1%	9%

c. Health Improvements and Ongoing Environmental Challenges

While insufficient groundwater continues to pose a constraint for salt production—with 39% of respondents still identifying it as a major challenge—the shift from diesel to solar-powered systems has led to significant improvements in health and well-being among women salt workers.

Before the intervention, 81% of women reported severe health issues related to the use of diesel in salt production. These included burns on the feet and body, skin infections, and respiratory diseases caused by prolonged exposure to diesel fumes and manual handling of equipment. Working long hours in harsh conditions, often barefoot and exposed to chemical residue and pollutants, further compounded their health risks.

Since the installation of solar-powered pumps, only 29% now consider health concerns a major challenge, marking a substantial improvement. Women reported fewer respiratory problems and a noticeable reduction in skin-related issues and physical injuries. The cleaner and more automated nature of solar technology has minimized their direct contact with hazardous materials, reduced exposure to noxious fumes, and lessened the need for intensive manual labor.

Overall, the transition to solar energy has contributed not only to environmental sustainability and productivity but also to **improved physical health, safety, and overall well-being** of the women salt workers. This health transformation underscores the importance of adopting clean energy technologies in labour-intensive rural industries

d. Climate-Related and Environmental Challenges

A significant 67% of women salt workers reported that changing climatic conditions—particularly flooding, windstorms, and unseasonal rains—pose serious challenges to their livelihoods. These extreme weather events disrupt the salt production cycle, damage infrastructure, reduce yields, and contribute to the growing unpredictability of work conditions in salt pans. Unseasonal rains and flooding often wash away partially formed salt crystals, while strong windstorms can damage bunds, pans, and even solar equipment. Such disruptions shorten the productive season and lead to substantial income losses.



In addition to climate-related impacts, the release and poor management of freshwater through canals within the sanctuary area further complicate salt production. Women salt workers reported that these unregulated or untimely releases flood salt pans with fresh water, diluting the brine concentration necessary for salt crystallization and setting back production by days or even weeks. This man-made environmental challenge adds another layer of uncertainty, particularly for workers who are already struggling to adapt to a changing climate and limited natural resources.

Together, these factors underscore the need for improved water management systems, better coordination with local authorities, and the development of climate-resilient infrastructure and practices to ensure the sustainability of salt-based livelihoods, especially for the women who are increasingly playing central roles in this sector.

e. Shifting Gender Norms and Empowerment

Women salt workers shared that, compared to earlier days before the intervention, there have been notable improvements in their work conditions and overall empowerment. The burden of physical labor has significantly decreased, with only 29% now reporting it as a major challenge, compared to 87% prior to the intervention. This reduction is largely attributed to the introduction of solar technology, which has minimized manual labor and allowed for better time management.

Table 24 :Key Challenges

	Before (N=70)	After (n=70)
qn_122_a. Access to land and other resources		
Highly Challenging	70%	7%
Moderately Challenging	23%	46%
Least challenging	7%	47%
qn_122_b. Work burden that leads to time limitations		
Highly Challenging	87%	1%
Moderately Challenging	13%	27%
Least challenging	0%	71%
qn_122_c. Limited mobility		
Highly Challenging	80%	0%
Moderately Challenging	14%	17%
Least challenging	6%	83%
qn_122_d. Doubts of your marketing skills		
Highly Challenging	70%	4%
Moderately Challenging	20%	34%
Least challenging	10%	61%
qn_122_e. Doubts of your communication skills with salt buyers		
Highly Challenging	71%	6%
Moderately Challenging	23%	31%
Least challenging	6%	63%
qn_122_f. Feel that you may fail in market negotiations because you are a woman		
Highly Challenging	81%	6%
Moderately Challenging	11%	31%



Least challenging	7%	63%
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Women's mobility has also improved dramatically. Previously, 80% reported that moving freely in public spaces was highly challenging due to social restrictions and lack of support. Today, 83% of women say mobility is no longer a major issue, reflecting a shift in social norms. Being part of the SEWA collective has played a crucial role in this transformation, empowering women to step out of traditional domestic roles and participate actively in community and economic activities. Many women noted that they now attend meetings, travel for work-related tasks, and engage confidently in public discussions—experiences that were once inaccessible to them.

There has also been a visible increase in women's confidence regarding market engagement and negotiation, with many expressing a stronger belief in their abilities to participate in price discussions and sales. However, observations during fieldwork revealed that, while collective market negotiations have strengthened, individual-level negotiation is still often led by male family members or SEWA representatives. There is not yet enough evidence to conclude a widespread shift in individual women's control over market negotiations.

That said, being a woman is no longer perceived as a limitation in these spaces. Only 6% of respondents reported feeling that their gender was a significant barrier in market dealings. Many women now view their identity as members of a women's collective as a source of strength, offering them visibility, voice, and legitimacy in traditionally male-dominated spaces.