



Implementing women-centred initiatives in India

results and lessons learnt on the ground



Executive Summary

S4S Technologies (“S4S”) is a food tech company serving the global dehydrated food market worth approximately USD 58 billion. With its patented **UN award winning solar dehydration technology**, women farmers cum entrepreneurs produce dehydrated vegetables at the farm gate and sell to S4S. S4S aggregates the produce, performs a thorough quality check and secondary processing at its ISO grade facility and sells the products to a range of B2B and B2C consumers. S4S farmers increase their income through reducing farm level losses and creating value added products, whilst S4S earns a margin on these unique and nutritive dehydrated products. S4S is currently working with over 2,700 women farmers, serving over 700 customers and with monthly revenue of USD 200,000.

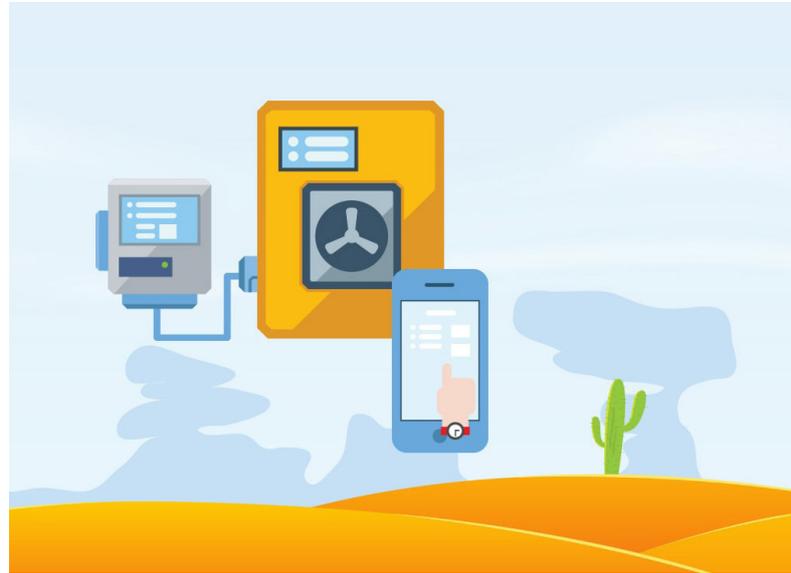
In 2018 the POWERED (Promotion of Women in Energy Related Enterprises for Development) programme was launched by FCDO India and Shell Foundation to increase gender inclusion across the energy value chain in India. S4S was one of the first businesses supported through the POWERED programme in order to create a scalable model which could create sustainable livelihood opportunities for women farmers. To achieve this goal, the grant was utilized in order to focus on two main objectives for S4S’s business.

Development of Standard Operating Processes to support S4S’s business model and training programme.

Gender specific interventions to improve gender inclusivity and improve operational performance.

This paper details the key achievements that S4S has accomplished through the POWERED programme since 2018, as well as key learnings and challenges that it and the market continue to face as it looks to

further integrate and support gender specific interventions. In addition, the paper will highlight [2] case studies of female micro-entrepreneurs who have benefited through the POWERED programme and the impact that it has on their lives, as well as further areas where support can be provided.



Key learnings and highlights from the paper include

- 1. The adoption of technology for training women micro entrepreneurs resulted in higher learning outcomes and facilitated faster adoption to the new Standard Operating Processes (SOPs) with less deviations.**
- 2. The policy of rigorous and continuous training for women micro-entrepreneurs in the use of the solar drying technology ensured greater stability of income for them and their families.**
- 3. Automation of standard processes has helped to achieve significant productivity improvement for S4S factory workers and has also driven cost savings.**
- 4. Automation resulted in reduced risk of physical harm to the factory workers.**

PART 1: Development of Standard Operating Processes to test S4S's model and training modules

Background

Utilizing the POWERED funding, S4S developed standard operating processes and criteria around which the selection of villages, women farmers and aggregators could be made in a more systematic and efficient way for easy replication and scale-up of their business model. Standard training modules were also developed to streamline the process of onboarding new smallholder farmers as well as the training of them on the proper usage of Solar Conduction Dryers.

Through a pilot scheme, S4S successfully tested the application of these new processes with 200 women micro-entrepreneurs and 692 women farmers. In addition, S4S developed and tested new training videos with end to end description of the dehydration process. Utilizing animated training videos, which only requires a different voice-over and subtitles in a regional language to be implemented in a new region, enables much faster scale up and adoption of the training across different regions.

Impact Delivered

1. Reduction in Onboarding time

The new S4S training modules have been widely accepted by the on-ground team and farmers, and have led to **79% reduction** (2 weeks to 3 days) in the onboarding time for women farmers, a great achievement.

2. Creation of better livelihoods

In line with the POWERED project's objective of creating and supporting women-led energy micro-enterprises, S4S successfully onboarded 180 women micro-entrepreneurs in Maharashtra and 20 in Odisha, providing them an opportunity to earn additional livelihoods of up to **Rs 5000 per month** which essentially **doubled** their basic income thereby giving them confidence and respect in their society.

3. Access to a productive use energy asset for women farmers

S4S provides marginal female farmers with its United Nations award-winning technology solar-powered dehydrator. The solar conduction dryer converts the fresh produce to dry goods to increase the shelf life of these products from a few days to a year without adding any chemicals or preservatives. Whether aware or unaware of the concept of food dehydration, the farmers attend the S4S training and start working as micro-entrepreneurs. S4S enabled easy access to **women farmers to be able to own the asset** at a very nominal rate in collaboration with banks. The training videos enable them to understand the procedure of drying and allow them the opportunity to utilize this improved technology to increase their income generation and source of livelihood. Also in the future, S4S plans to implement production

of 3 batches per day through their training model, against which the payment for 1 batch would go as a loan repayment daily thereby enabling the farmers to get confidence to process more batches and also eventually own the asset.

Key Lessons learnt and Challenges faced in the process

The key learnings of the program were:

1. There were multiple on ground challenges that S4S faced while implementing the SOPs designed at an R&D level due to several practical challenges that villages in India face. Upon scaling up the SOPs S4S generated several learnings which enabled them to remodel their SOPs by incorporating these on-ground challenges. The new approach being followed now involves running a pilot at a village level and thus a number of these challenges were mitigated by simple modifications in design and implementation of the SOPs.

Lack of reliable electricity and metered connections which led to batch wastages and below par output (compared to assumptions based on having reliable power) - S4S directly approached the electricity boards and issued a letter asking for supply of electricity for a fixed period of the day which enabled fewer interruptions during the drying process and increased output.

Unpredictable weather conditions - S4S planned production in a way as to incorporate weather situations and plan harvesting and processing accordingly. The modus operandi of S4S was to purchase crops from farmers

present anywhere across the country at a fixed rate and supply the crops to the Micro-entrepreneurs. This enabled risk mitigation from climate changes as the MEs were not dependent on the positive outcome of their own crops.

Crop and drying quality - upon processing the output quality (colour of dried produce, moisture content etc.) of the MEs would often vary significantly, both due to differences in field processing affecting quality of the raw produce, as well as small personalized modifications that were made by MEs during the drying process. These issues have been mitigated through adjustments to the SOPs to prevent any personal modifications being made to the process, as well as streamlining of the field processing which has enabled better quality output as well as more standardized results across different villages.

2. Another challenge faced was that many of the women were working on their own which often led to lower productivity. S4S encouraged women to work together with their neighbors (S4S MEs) which fostered a greater spirit of collaboration and sharing of best practices, thus improving productivity.

3. The creation of SOPs and learnings derived from the implementation of pilot enabled more efficient onboarding of new team members across newer villages.

4. The fungibility of the SOPs enabled S4S to scale the recruitment of the Micro entrepreneur model to multiple villages in much less time with reduced efforts required from S4S staff.

5. Prior to working with S4S, the women in the villages had no sustainable source of income however this model has enabled them to become self-sufficient, have a steady source of income, and develop their innate skills. This in turn led to productivity and income for S4S.

S4S Way forward

While the initial model of the program has witnessed significant impact, S4S remains committed to refining the model even further by making structured improvements to the overall program design.

1. While the new training SOPs have achieved significant impact, S4S had 2 major limitations:

Time taken to train and onboard new MEs.

Cost of training.

To remedy this S4S plans to conduct common training sessions across multiple villages. This will foster a spirit of peer to peer learning amongst the micro entrepreneurs and enable S4S to train multiple people at the same

time thereby driving significant cost and time savings.

2. Currently the micro entrepreneurs produce 1 batch per day which causes 2 major drawbacks for S4S

Number of productive days per year are fewer

Capital is tied up in under-utilised drying equipment

S4S is currently evaluating these 2 issues in order to look at interventions that can help to help improve productivity of the MEs, such as a) continuous R&D on the equipment to improve capacity or a reduction in process time, and b) drive further awareness and training campaigns in the villages in order to try and increase overall efficiency of MEs activities and thus the number of productive days assets are used for.





Case Study: Anita Kolte, Bhavadi, Maharashtra

PROFILE: Anita Kolte of Bhavadi, Maharashtra was married off to Rambhau Kolte at the age of 18. The family of five owns half an acre of rain-fed agriculture land. Anita is uneducated but wants to provide her children with quality education. With an average income of Rs 40,000 to 50,000 (USD 700) that seems a bleak possibility as it is not enough to even fulfill their basic requirements. A daily wage farm worker during the harvesting season and a tailor for the rest of the year, Anita was unaware of food dehydration until S4S approached her to become a micro entrepreneur.

IMPACT OF S4S: Training by S4S and a leap of faith is what took Anita to start earning a steady income of Rs 4,000 to 5,000 per month.

As a result, her family now help her run two batches in a day to increase their daily income so that they can send their elder son to the city for higher education. S4S has not only given marginal farmers, farm workers and daily laborers from Bhavadi village a chance to earn a steady income without having to migrate but also instilled confidence in Anita and her peers.

FUTURE SUPPORT TO ANITA: S4S plans to continue working with Anita in order to support her dreams and ambitions. They plan to provide Anita and her family with more equipment which can proportionately increase her output and thereby doubling her income. S4S also plans to work with Anita as a model ME and enable her to train newer MEs in the village.

“If it weren’t for S4S, I don’t think I could have completed my children’s education, or Dream further for their higher education. S4S facilitated my children’s education, unlike most of the rest of the village” says Anita.



Case Study: Amol Padul, Hatmali, Maharashtra

PROFILE: Amol Padul of Hatmali, was a student living with his mother Prabhavati tai Padul and younger sister in Hatmali. Being the only man of the house, Amol dreamt of being well educated working in a company and earning well for his mother and sister. His mother was given the opportunity to work as an ME for S4S in 2015 where she would dehydrate different types of vegetables. Amol would often motivate his mother in women empowerment and also learnt to use the equipment himself. Following wanting to learn more about the operations of the company that had fulfilled his mother's dreams of being self-employed, he approached the company and was introduced to the S4S co-founder. S4S recognized Amol's potential and provided him the training to work with them in a project named GCI along with the co-founder where he led a team of women farmers like his mother and trained them to dehydrate vegetables.

IMPACT OF S4S: Amol found this work very interesting and different and he joined S4S as a full-time employee in Feb 2019 fulfilling his dream of working in a company. Between Feb 2019 - June 2019 he started work as a production head for S4S field operations whereby he handled a total of 50 women Micro-Entrepreneurs and led them to ensure production targets were met smoothly and efficiently. From July 2019-Dec 2019 he started work on an initiative of S4S, lease farming of Onion, French beans, and Carrots as raw material supply to S4S processing.

FUTURE SUPPORT TO AMOL: S4S plans to continue working with Amol and his mother in order to support their dreams and ambitions. They plan to provide more opportunities to Amol to showcase his talent and ability to outperform any task given at hand. S4S sees Amol as their backbone who will one day head the complete warehousing operations for S4S.

"Before working with S4S I was always very shy and low on confidence; however S4S made me a confident man who is now capable of also delivering trainings and speeches to guests visiting the company. S4S not only helped me fulfill my dreams but also my mothers." says Amol.

PART 2: Gender Specific Interventions

Background

S4S identified that a number of its existing systems and processes were both not suitable for women employees, as well as being inefficient and tedious, impacting on the business' operational efficiency and ability to effectively hire women into a number of critical roles. In particular, S4S identified three key challenges of its existing systems:

1. The weight of trays was too high; requiring two women to carry a single tray before washing it for two and a half hours. It was very difficult for them to wash in batches because of the excessive weight - the procedure was tedious, labor-intensive and time-consuming.

2. The movement of materials was labor intensive due to the weight of both the raw materials and the trays, requiring a minimum of two male workers to handle them. Automation of this process was required to expand the efficiency of the workers in material handling and to decrease the manual labor involved in the process.

3. Raw materials were loaded directly onto stainless-steel trays while loading batches. The dehydrated vegetables adhered to the stainless-steel trays making their extraction time-consuming and tedious for workers who had highlighted the issue to management.

As a result of identifying these existing issues, S4S changed a number of processes and infrastructure in the centralized food inspection facility, including automating procedures and operations to reduce heavy lifting, resulting in ease of use for women employees, reduction of time taken for operations and increase in safety of operations.

Through this initiative S4S has **increased the number of women working in the factory by 70%**. The company has also updated infrastructure to make it gender inclusive by adding female toilets and rest areas. Further details around specific interventions are detailed in the Spotlight section below.

Impact Delivered

1. Reduction in manpower required completing the job

Previously it required two or more workers to do key jobs in the S4S facility, but now a single woman worker can do the same job effortlessly. The new methods implemented have improved the speed of the process as well as reduced human efforts involved.

2. Reduction in water consumption

The water consumption in the cleaning processes has been reduced by 50%. This is through both a reduction in the dehydrated products that stick to the plates due to the introduction of Teflon sheets, as well as introducing a new adjustable water pressure system thereby conserving water and effectively utilizing automation.

3. Reduction in time taken to complete the task

The process of carrying and washing the plates has been shortened, reducing the time from 2 hours and 30 minutes to less than an hour. This is both through the introduction of new technology and processes into the system, as well as utilizing staff time more efficiently so that they are more effective in their tasks.

4. Reduced risk

The introduction of hydraulic scissor or lift tables to reduce manual labor has also resulted in reduced accidental risk in the factories while loading the materials at a higher elevation. Likewise, it has minimized the exhaustion and stress to the operators.

5. Reduction in product waste

Replacement of stainless-steel trays with Teflon sheets at the factory has resulted in a decline in waste material generated as a process byproduct.

Key Learnings

1. Automation need not be complicated, simple tools and machines can create significant impact to the production process.

2. Identification of the right problem statement is important, in the case of S4S the problem was not that productivity was low because of lesser efforts, but rather it was due to the absence of the requisite tools and processes.

Key challenges

1. S4S employees did not share exact problem statement that they faced initially and this resulted in a loss of productivity. However, S4S adopted a policy of openness and feedback which enabled the factory employees to share their grievances which could later be addressed.

2. The challenge of incurring a higher capital cost upfront was set off by higher productivity and improved happiness quotient amongst employees, thus making the investment pay off both in terms of capital repayment and improved staff morale.



Spotlight on key S4S interventions

Introduction of washer guns for cleaning trays at the factory

KEY INTERVENTION: Industrial washer guns which are versatile and easy to operate. The new method was intended to lessen human exertion and the time required to clean the plates. This high-pressure water gun is ideal for cleaning as the water pressure can be controlled as per the requirement. This method is used to increase the productivity of labour in the washing of trays and to avoid wetting the floor area



Previous manual cleaning method



S4S staff using new washer guns

IMPACT ON S4S STAFF: *“This automation has helped me to significantly reduce the time and effort I used to spend in washing the plates. I am now able to spend more time with my family and help my son with his homework after I reach home.”* - says a S4S female factory employee.

Introduction of hydraulic scissor or lift tables to reduce manual labour

KEY INTERVENTION: Hydraulic scissor lift tables were introduced in the processing plants. The new system is structured with the intent to decrease physical work. These pressures driven lift tables are exceptionally ergonomic, which enables the workers to securely move the plate, restricting the dangers from manual dealing. The water-powered lift table offers simple stacking of materials and furthermore decreases the danger of mishaps. It can lift till 1000kg with the hydraulic system.



Hydraulic scissor lift table



Previous manual lifting method

IMPACT ON S4S STAFF: *“My occasional backaches has been completely eliminated after the installation of this automatic scissor lift”* - says a S4S female factory employee.

Replacement of stainless steel trays with teflon sheets at the factory

KEY INTERVENTION:

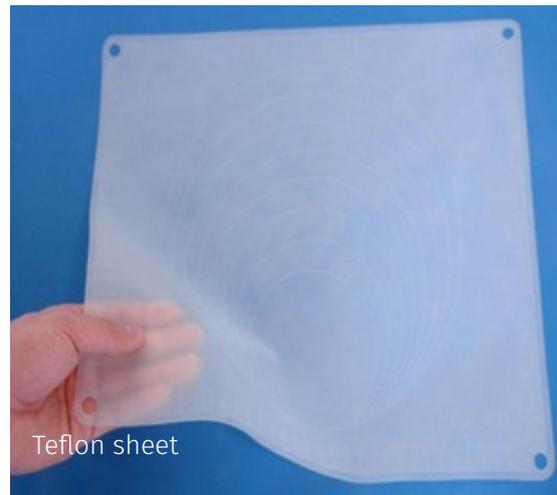
To speed up the loading and unloading process of the batch in hot air dryers, teflon sheets were introduced at the factories. The new system was implemented to reduce the time required to load and unload the material from the tray. Since teflon is non-sticky, it cleans itself. Teflon sheets are a great way to keep machines clean because the materials just slide right off of surfaces that are coated with it. These sheets were effective at a wide range of temperatures making them ideal for many applications.

IMPACT ON S4S STAFF:

“Without the Teflon sheet, vegetables stuck to the trays making it difficult for the workers to scrap it off. In the case of carrot, the residues are very sticky, which are now washed without any difficulty”, says Asha Rithe, an Aurangabad factory employee



Stainless steel tray



Teflon sheet

Shell Foundation | 

 UK Government