

# **Needs Assessment Report of Solar Energy Solutions by Micro-entrepreneurs**

**For SELCO**

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## Section 1 – Introduction and background

The Earth receives more solar energy in one hour than the world population consumes in an entire year<sup>1</sup>. But access to reliable electricity or energy has always been a challenge for entrepreneurs in India. This is especially the case in rural areas. Karnataka is a power deficient state and it has been facing energy scarcity over the last few years. Limited availability of power results in power cuts which affects people and businesses. For some businesses, frequent and long power outages can have considerable impact on their operations rendering them almost unviable. There are entrepreneurs who are unable to expand their businesses due to lack of reliable electricity supply. The cost of alternative energy sources like diesel generators is high and they also add to pollution. Fortunately, Karnataka has a very good solar potential and receives an average insolation more than 5 kWh/m<sup>2</sup>/day, having about 300-330 clear sunny days<sup>2</sup>. In such a scenario, adoption of solar energy provides a viable solution to address energy needs of the general population and businesses. This also helps in developing enterprises which can be part of the solar product distribution chain.

SELCO Foundation works for the under-developed population, and focuses on providing sustainable energy solutions. It is committed to disseminating and sharing its innovations, designs and learning for the advancement of under-served communities everywhere. SELCO Foundation has been promoting use of solar energy alternatives for micro entrepreneurs in Karnataka. Their products include solar fridge, solar sewing machine, hawker's light and *roti* making machine, among others.

Best Practices Foundation (BPF), a Bangalore based NGO, has excellent capabilities in developing and training entrepreneurs through its Market Oriented Value Enhancement (MOVE) model, which is an international award winning initiative. BPF is experienced in setting up individual businesses and enhancing their viability and sustainability. MOVE training for entrepreneurs includes aspects like market research, business planning, book keeping, and market linked development of businesses.

In order to understand various challenges faced by micro entrepreneurs during the adoption of solar energy products, SELCO Foundation reached out to entrepreneurs who use their products. The issues faced by them could be technical, financial, or difficulties in expanding their solar product based businesses. Understanding of issues not only helps in taking steps for their resolution but also creating a strong process to accelerate solar energy adoption. Considering these aspects, SELCO Foundation commissioned BPF to conduct a needs assessment exercise.

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<sup>1</sup> <http://www.scidev.net/global/energy/feature/solar-power-for-the-poor-facts-and-figures-1.html#sthash.xgy5lOc3.dpuf>

<sup>2</sup> [http://wgbis.ces.iisc.ernet.in/biodiversity/pubs/ces\\_tr/TR132/solarenergy.htm](http://wgbis.ces.iisc.ernet.in/biodiversity/pubs/ces_tr/TR132/solarenergy.htm)

## Section 2 - Objectives and methodology

The objectives of needs assessment exercise were:

- To identify challenges faced by entrepreneurs who use SELCO's solar energy products, with the purpose of resolving the gaps faced by them and enhancing their businesses
- To identify opportunities and issues that can help SELCO Foundation strengthen their entrepreneurship programme

### Methodology

The strategy adopted for the exercise was two-fold.

1. Conduct a business needs assessment using a) focus group discussions (FGDs) with entrepreneurs grouped in specific enterprises and b) surveys of individual entrepreneurs.
2. Educating entrepreneurs about various aspects of business management like the principles of marketing and importance of basic accounting and book-keeping. These were done with the help of role plays, games, presentations and interactive sessions, for better understanding of concepts in relation to their own businesses.

The following activities were undertaken during the needs assessment exercise:

#### a. Data Collection

- FGDs with specific enterprises - Homogenous groups of entrepreneurs were created based on similarity of businesses and usage of products. FGDs were conducted to understand their issues.
- Obtained in-depth information from individual entrepreneurs on their specific businesses, with regard to their business needs and challenges.

This needs assessment exercise attempted to understand the issues being faced by entrepreneurs who use solar powered equipment for their businesses, and also to enhance the solar energy adoption among entrepreneurs.

#### b. Limitations

Low attendance of entrepreneurs was one of the major constraints. This was primarily due to a reluctance on the part of entrepreneurs to leave their business unattended to participate in the workshop. This was also because many of them could not afford to lose a day's earnings. Some participants reached the venue late and had to leave early due to a lack of availability of transportation.

Hence, the time available to carry out all the exercises as planned was limited. While participants were able to have rich discussions in their respective small groups, time was a constraint when it came to each group presenting their findings to the larger group for discussion. Similarly, time was limited for individual entrepreneurs to provide data for the detailed survey designed by BPF. As a corrective, participants were later contacted telephonically for follow up clarifications and further discussions.

## Section 3 – Key findings - Business challenges / issues

### I. High initial outlay of solar products

Overall, the entrepreneurs lack information about the benefits of investing in solar products. They do not realise that using solar products could lead to an increased savings, potentially enhanced earnings, or increased production capacities, all of which could boost businesses and increase incomes. Also, SELCO does not provide information to potential clients on the economics of their solar powered products.

Most entrepreneurs perceive solar products as very expensive. For instance, the cost of a 240 liter capacity solar powered fridge is more than INR 1 lakh, which is much higher than that of conventional refrigerators. Despite the higher potential savings through usage of solar products and the power shortages that effect efficacy, entrepreneurs prefer conventional fridges powered by electricity. During the workshop, a woman expressed experiencing pain in her legs from using her manual sewing machine and found the prospects of owning a solar powered sewing machine very attractive. Entrepreneurs who do not have a solar powered *roti* making machine and make *rotis* manually reported the high cost of labour impacts their incomes. Educating entrepreneurs/prospective customers about the return on investment and the financial benefits in solar products, along with health, environment and other benefits will help them make informed decisions. If entrepreneurs are made aware of various financial incentives/subsidies from government/ banks/ institutions, it will further accelerate the solar adoption process.

In addition, entrepreneurs should be assisted with developing business plans for their ventures so that it is process driven rather than being intuition driven. Exposure visits to successful ventures or regular updates on methods of doing business could help entrepreneurs understand the nuances of the trade and learn better ways of managing their enterprises.

### II. Limited technical know-how

Insufficient technical knowledge of entrepreneurs in terms of regular operations, maintenance and minor repair of their solar products is another major issue. This is especially true in case of hawkers' lights and solar fridges. Simple maintenance and repairs of hawkers' lights like filling distilled water in batteries and the know-how on re-charging the battery, is either limited or unknown to the entrepreneurs owning solar powered equipment. Due to this, they are dependent on technicians to solve their issues which often results in delays, which impacts their businesses adversely.

The same is the case with entrepreneurs owning solar fridges. They are ignorant on aspects that include running time of the fridge, charging of batteries using conventional electricity during cloudy weather, and so on. Also, they are apprehensive about carrying out minor repairs lest it damages the equipment.

For entrepreneurs who use solar products, enhanced and continuous technical support is required. The installation process should also include a brief on day-to-day maintenance of products like charging batteries, cleaning, minor repairs, and the necessary dos and don'ts. In specific cases, following up on issues faced and resolving them is key to ensure a good experience with solar products.

### **III. Difficulty in accessing finance for business**

Access to finance is a continuous requirement for entrepreneurs. Local money lenders are not a viable option, due to the high rates of interest that they charge. Availing loans from banks is a complex process as banks are typically conservative in their approach to giving loans. Moreover, they require collateral, which is hard for most entrepreneurs.

During the interactive sessions, some entrepreneurs expressed the need for financial assistance to expand their businesses. For example, there is a specific case of an entrepreneur who rents out hawkers' lights. Her venture is doing well and she wants to buy some more batteries to reach out to more hawkers. However, since she has already taken a loan which is in the midst of the repayment cycle, she is unaware of how to take another loan to expand her business. The entrepreneur explained that though the market (where hawkers sell their wares) is about a kilometer away, daily delivery and collection of batteries to the hawkers requires multiple to and fro journeys by bicycle. Collecting money from hawkers also requires multiple visits. A motorised vehicle would overcome this issue but accessing loans is a major barrier.

Entrepreneurs lack awareness on how and where to access loans for their businesses. Some entrepreneurs reported that they can expand their customer base if more credit facilities are extended to them. Though SELCO Foundation does not have a provision for direct funding for expansion of business yet, they are willing to support entrepreneurs by being a guarantor to a portion of the bank loan, in case the bank approves the loan. The foundation is also willing to lend their support through partial interest rate subvention.

In order to make financial linkages easier for entrepreneurs using SELCO's solar products, capacity building of entrepreneurs on various aspects of financial linkages is key to them expanding their business. This primarily refers to making credit easier for them to avail, in order to buy solar products. Awareness about sources and options of finance, development of structured business plans and then approaching financial institutions, is crucial to the expansion of enterprises. Specific programmes can be conducted for entrepreneurs on these lines for greater familiarisation of financial processes required for their businesses.

### **IV. Low capacity utilisation**

Any investment in infrastructure by entrepreneurs should be accompanied with a corresponding increase in income. Better infrastructure increases production capacity, which in turn, caters to more customers. However, some entrepreneurs have limited expertise in understanding the markets and on how to expand their customer base. So, while an entrepreneur invested money in a solar sewing machine, to increase the efficiency of her business, despite her investment, she continues to earn a low income due to not understanding the market. In another example of low capacity utilisation, a woman who made *rotis* to sell, had limited output due to long power cuts. She invests in a solar *roti* making machine, which in turn, improves the production of *rotis* considerably. However, due to a lack of marketing skills and an ignorance on how to attract customers, the *roti* making machine is underutilised. This impacts the ability of the entrepreneur to pay back the loan taken for the machine.

Training on efficient capacity utilisation of solar products is directly linked to the better marketing of products, which can increase the income potential of entrepreneurs. Training support could take the form of business development and the tapping of new customers. In-depth training programmes about accessing new markets can help in optimum utilisation of the production capacity of the solar products,

thereby, helping the entrepreneurs repay loans faster. In some cases, based on market analysis and the requirements of new markets, skill up-gradation trainings may be imparted. This could lead to diversification of product lines by entrepreneurs, which in turn will enhance their customer base and expand the market further. This ultimately assists in an increased adoption of solar products.

#### **V. Lack of proper accounting practices**

Due to a lack of proper accounting and record keeping, many entrepreneurs find it difficult to calculate their incomes or profits. Therefore, they are unable to understand or make the necessary adjustments in their business to steer it towards being a success. Reasons for a business failing could be the cost of inputs, supply bottlenecks, competition, etc. Keeping track of prices, suppliers, customers and inventory through sound accounting processes is important when running a business. The price of each purchased product must be known in order to determine the selling price. Only a clear accounting system can help the entrepreneurs track costs and profits to make the right decisions at the right time.

Capacity building on accounting and book-keeping is essential for entrepreneurs to make informed decisions about their businesses. Irrespective of the volume of business generated by an enterprise, a sound accounting system can help the entrepreneur see specific advantages of using solar products. This will also help in changing the perception of solar products being expensive. For example, an entrepreneur who uses a solar fridge in his hotel business, generally keeps track of expenses, but by book keeping, he can figure out how much he saves by using the solar fridge.

A proper accounting system can help track income and expenditure in a business, and plan for the future and also help to assess if the business is profitable. A robust accounting system could also be the crucial factor in availing credit and planning for expansion.

#### **VI. Bottlenecks in the supply of inputs**

There are other issues like transportation of raw material (*jowar*) to flour mills, which is a cumbersome process. This is especially true for entrepreneurs who live in remote areas and need to visit flour mills frequently. In addition, power outages at flour mills further delay processes. For relatively large scale entrepreneurs, manual dough making is an expensive and less efficient system, as they need to employ more people.

An example of impediments in the supply of inputs is that of milk and milk products, which have a demand throughout the year. KMF (Karnataka Milk Federation) products (Nandini brand) have always been preferred by customers, primarily because of its competitive pricing and brand value. However, the entrepreneurs with solar fridges do not have KMF dealerships. They get Nandini products from the other dealers and have to sell it at higher prices because of input costs and addition of their margin, which ultimately results in low sales volumes. Hence, even though the business opportunity and the market exists, they are unable to take advantage of it. If SELCO assisted entrepreneurs who have invested in a solar fridge, to acquire a dealership, whereby they can buy and store milk products, the popularity and cost effectiveness in solar products will be highlighted.

In view of issues like higher time and costs associated with manual dough making, or transportation of *jowar* to mills to make flour, and to address the supply gaps in general, solutions like providing storage could be explored. It could be useful for SELCO Foundation, not only to develop products for these needs,

but also to attempt to put systems in place, whereby entrepreneurs using solar products can operate seamlessly.

## Section 5 – Ways forward

It is clear from the needs assessment exercise that for solar products to make a significant difference to the livelihoods of micro-entrepreneurs, a comprehensive and inclusive approach is required. Each entrepreneur has his/her own set of ecosystem issues, which needs to be proactively addressed, and such actions can be developed into a refined process. The actions to be taken can be as follows:

- **Continue educating entrepreneurs in a holistic manner and in line with their businesses about the financial benefits and incentives around solar products.**
  - This includes providing detailed yet simple financial analyses which takes into account savings on electricity, increase in income, among others.

It is therefore recommended that SELCO provide a cost benefit analysis and show the returns and benefits within a specified time to the potential entrepreneur.

- **Enhance technical support and provide more details about the product during installation and maintain an efficient after sales service.**
  - This could mean creating a FAQ flyer about the product which gives clear directions on the steps to be taken for minor repairs and maintenance.
  - Creating a helpline for assistance at any point in time could be beneficial. This could also help in generating interest from potential entrepreneurs.
- **Capacity building on accessing finance**
  - Impart more information and knowledge about various options to access finance
  - Help create better and structured business plans which can help entrepreneurs access credit in a more professional manner

It is therefore recommended that SELCO consider putting systems into place to provide entrepreneurs using their solar products, the know-how on accessing loans for their enterprises. SELCO Foundation has assisted some entrepreneurs with bank linkages for investments in solar products. The modalities of this process are yet to be worked out and communicated to the entrepreneurs. SELCO could review, analyse and understand the credit histories and credit related needs of their entrepreneurs and the impact of credit on the businesses. SELCO also would need to know the repayment rates and capacities of their existing entrepreneurs. This would provide them clear directives on future decisions regarding subsequent loans and size of loans. This should be matched against a portfolio of credit options through SELCO and banks which SELCO can negotiate with banks to tailor credit products to the specific needs of their entrepreneurs.

- **Invest more in training on capacity utilization** : Capacity utilisation can be achieved if entrepreneurs are able to look beyond their immediate businesses and identify new customers regularly. This can be done by providing regular training on marketing as well as new business development.

It is recommended that since it is market-based, MOVE training to entrepreneurs would be helpful in evolving businesses, entering new sectors. SELCO could partner BPF to train their entrepreneurs on

markets and on expanding their customer base. This would ensure higher utilisation of capacities and also ensure quicker repayment of loans.

- **Introduce accounting and book keeping:** It is recommended that basic training on accounting and book keeping be made available to entrepreneurs who use SELCO's solar products in their enterprises. This will dispel the perception of solar products being an expensive investment and help entrepreneurs realise the benefits and savings incurred by using solar products.
- **Other areas for assistance:** SELCO Foundation could consider vertical integration of products for the entrepreneurs, to make available a complete end-to-end solution for businesses using solar products.

## Annexure 1 – Participants’ Feedback

### Participants’ Feedback

- The workshop was very useful in terms of providing information on all aspects related to business. We would like to get in touch with you in case there is any assistance required. – Saleema
- We have achieved the workshop goal in terms of gaining knowledge about business. – Viranna
- I had never attended such a session. It was a great learning. I will definitely attend more such workshops, given an opportunity. – Srinivas
- I knew only about sewing machine and water pump. Because of this workshop, I got to know about other businesses which can be run by solar energy. I will try to explore where solar solutions can be used - Arjun
- I would like to have more training on different types of stitching so that I can expand my business. – Rama
- I work as an agricultural laborer. After attending this workshop and meeting all these people, I’m motivated to do something on my own. – Neelamma
- Many other companies do not show up after providing the machine. It’s difficult to contact them if anything goes wrong with the machine. However, with SELCO I have not experienced such an issue. - Jambava
- I am an agricultural labourer. After attending this workshop I feel I can also do some business. – Ratna
- I have been making *Jowar roti* manually. Now I’m thinking of buying a *roti* making machine. – Prema
- I sell soft drinks. Now I’m thinking of selling milk and milk products as well. I learnt many things about business here. – Uma

## Annexure 2 – Business description

The participants who attended the needs assessment workshop can be grouped under four categories based on their use of solar products.

1. **Solar light for hawkers:** Most street hawkers sell their wares with the aid of kerosene and petromax lamps. This often ends up damaging the produce and imposes a high daily cost on the cash strapped vendor. SELCO has developed a unique business model whereby these vendors can avail of clean, bright light at an affordable price everyday through solar entrepreneurs. The process is as below:

Solar lights help street hawkers sell their wares for longer periods of time, thereby allowing them to increase their daily income. An entrepreneur gets a solar battery charging station installed. She/he charges solar light batteries and for a nominal fee, rents the batteries to the hawkers to use. Once the battery is discharged at the end of the day, the entrepreneur collects it from the hawker and puts it to charge on the charging station. This provides additional income for the entrepreneurs as well as increases the livelihood of the vendor.

2. **Solar sewing machine:** For businesses involving tailoring, regular sewing machines can be difficult to use for long hours resulting in pain in the legs. Some sewing machines are fitted with electric motors to make sewing easier. Besides the cost factor, the irregular supply of electricity causes constant disruptions to the business. But when regular sewing machines are fitted with solar powered motors, it improves productivity and reduces the amount spent on electricity. This helps increase productivity, saves energy costs, and reduces drudgery.
3. **Solar *roti* making:** Manual *roti* rolling is cumbersome and time consuming. Lack of continuous and reliable electricity impacts the business of *roti* making. Solar *roti* making machines are basically *roti* rolling machines. These machines take around 10 seconds to roll a *roti*. These are very helpful in saving energy and reducing drudgery.
4. **Solar fridge:** Many micro entrepreneurs who run hotels and *kirana* shops still lack access to the state electricity grid. Lack of cold storage equipment results in product spoilage and entrepreneurs are forced to buy in small quantities which means they end up paying more. It also affects businesses which depend on serving items cold like soft drinks and other foods which has a high demand throughout the year, especially during summer. This limits their income opportunities.

Solar powered fridges reduce dependency on conventional electricity, and ensure stable power without any interruptions. This also helps increase the shelf life of perishable goods and makes it easy to store milk and milk products, soft drinks, among others.

