



Title: Solar Sewing Machine for a small business owner

Case Study no: 20

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Key terms: Sewing Machine, Energy Efficiency, Livelihoods, financing, entrepreneur

The case captures the opportunities of a livelihood-decentralized energy nexus through the example of a local entrepreneur's tailoring business. Mr. Venkatesh in the Kolar district of Karnataka has been running a tailoring shop for the last 17 years. Even after using an electric motor for carrying out his work, poor electricity supply turned out to be a big hurdle for him to meet the customer's demands. SELCO India identified this as an opportunity to incorporate energy efficiency and solar energy into the existing system. SELCO also facilitated a loan to enhance his ability to repay the cost of the system. This has made a clear impact in reducing his electricity consumption, improving productivity, financial inclusion and enhancing his income.

Identification

During a routine demonstration and awareness program by SELCO India in the local village, Venkatesh learned about solar technology and the grid independent opportunities it presented.

Need Assessment

The SELCO India team carried out multiple visits to the site and interviewed the customer to identify the problems he faced with his existing sewing machine setup and also the technical specifications of the same. The need assessment also covered the necessary financing requirements

Project Nuance

As Venkatesh was disabled, the bank wanted the loan to be disbursed through the joint account with his wife so that they have an assurance of repayment. However, the SELCO Branch Manager outlined to the bank manager that a joint account would be difficult for both Venkatesh and his wife as they would need to visit the bank multiple times for paper work. He pointed out the fact that lack of conveyance options from the village would also be a big hurdle for both of them to visit the bank. The banker conceded and went on to finance Venkatesh individually.

Mr. Venkatesh, a tailor in the Kolar region, Karnataka was using an electric sewing machine for his work. There were frequent power cuts because of which he could only operate the machine for four hours a day. As he has polio, it was difficult for him to operate the machine by foot. Despite having a strong customer base, he could only stitch 2-3 pieces per day and hence was limited in his capacity to meet demand.

SELCO India had organized a demo at a nearby village for solar home lighting systems. Mr. Venkatesh was present at the demonstration and recognized an opportunity to make his sewing machine grid-independent. SELCO has been working on energy efficient machinery for various livelihood activities to increase productivity. This expertise coupled with a thorough need assessment resulted in the creation of a highly efficient solar powered sewing machine.

With the technical solution intact, SELCO approached a local bank, Pragati Krishna Grameen Bank to assist Mr. Venkatesh with a loan for buying the motor and solar system. Initially, the bank manager refused the loan citing lack of service from companies selling solar products as the reason. Hence the bank was skeptical about financing solar products. In order to build the confidence of the banker, SELCO did two things:

- sent out technicians to service other companies' products and assured people that they would re-visit the system once every six months.
- visited the Regional Manager of the bank to impress upon him the relevance of the product and the need for financing for entrepreneurs like Venkatesh. Following this, the Regional manager directed the branch manager to disburse the loan at the earliest.

Once the confidence of the bank manager was restored, he agreed to finance Venkatesh. From the day Mr. Venkatesh made the enquiry till the day the system was installed took a total of seven months.

System Design

SELCO India replaced the inefficient universal motor with a more energy efficient DC motor (60 W) and solar powered the system. Solar panels of 60 Wp with 30 Ah battery were used to provide 8 hours of backup/day. The system was designed to run for 8 hours a day.. Had we not replaced the universal motor with a DC one, solar panels of 100Wp would have to be used and the system would have been double the cost. Hence it was an important step to scout and implement a more efficient motor.



Financials

The total cost of solar powering the whole system was Rs.18,000. Out of this, Rs.2,000 was paid by Mr. Venkatesh, Rs.3,000 was a contribution from SELCO Foundation and Rs.13,000 was given as a loan by the bank. The EMI for the loan is Rs.450 per month for three years.

His revenue was initially between Rs.350-400 a day but after solar powering the system, his revenue has gone up to Rs.700-Rs.800 a day. Due to solar powering the setup, his electricity bill has also come down by Rs.16-Rs.18 a month based on an initial calculation.

There has been a significant increase in income after solar powering the machine and Mr. Venkatesh says that he has no problem paying the EMI.

Impact

Previously the poor power supply conditions restricted Mr. Venkatesh's working hours to approximately 4 hours per day and this included an hour of manual pedaling. After the intervention, he is able to work for 8 hours per day. Initially, he could cater to 2-3 customers per day and had profits of about Rs.2,000-Rs.2,500 per month. After the intervention, he can cater to 6-7 customers per day and has a profit of about Rs.4,500-Rs.5,000 per month. He is also saving between Rs.16-Rs.18 a month on electricity bills.

Total Cost of the System	Rs.18,000
Downpayment by the end user	Rs.2,000
Amount Paid by the SELCO Foundation	Rs.3,000
Amount taken as loan	Rs.13,000
Interest Rate	11.5%
Loan Tenure	3 years
EMI	Rs.450
Total Amount to be repaid to bank	Rs.16,200
Total Amount spent on the system (including interest on loan)	Rs. 21,200

Pre intervention (Profits/Month)	Rs.2,000-Rs.2500
Post intervention (Profits/Month)	Rs.4,500-Rs.5000
Increase in profits/Month	Rs.2,000
Post intervention- Savings on electricity bill per month attributed to solar sewing machine(based on observations in SELCO Foundation Lab tests)	Rs.16-Rs.18
Savings on electricity bill per year	Rs.192
Increase in profits/Year	Rs.24,192

Number of years to recover costs

= Total amount spent on the system/Increase in profits per year

= Rs.21,200/Rs.24,192

=**0.88 years**

INNOVATION

More efficient Motor and solar powered setup

Financing Livelihoods: A solar powered sewing machine financed by a bank.

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