

# Women Centric Solar Dryer Food Enterprise Project

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## 1. Introduction

Women centric solar dryer enterprise is a livelihood model, focusing on the livelihoods of rural women of Haveli and Daund Taluka in Pune district of Maharashtra. Before understanding the model, one must understand the meaning of livelihood, which basically refers to securing the basic needs for human survival. Livelihood is defined and factored into a set of activities in which an individual is involved to fulfil his or her needs for existence. This covers the economic and social wellbeing of the individual. Securing livelihood opportunities for women is one of the many goals of the model. As women in rural areas are deprived of opportunities and chances of improving their living conditions and livelihoods.

In this case study, the major focus is to understand the importance of building capacities and giving opportunities to women in improving their livelihood. The beneficiaries of the case study are women of Self-help groups, who prior to the project intervention, engaged in minimal or no entrepreneurial activities.

### 1.1 Need Identification and Genesis of the idea

BAIF Development Research Foundation has been working for the development of rural poor for the past 54 years. BAIF is known for its innovative livelihood interventions (Wadi programme, Artificial Insemination programme, Prerna, etc). BAIF has reached to almost 1,64,835 villages across 13 states of India. BAIF has a strong programmatic presence in 15 Aspirational Districts of India.

BAIF has reached out to a large number of women farmers and entrepreneurs through its women centric interventions. BAIF's massive coverage and successful interventions makes it an experienced organisation to work for the empowerment of rural women.

In the year 2016, BAIF realised the need of stepping forward to work for the economic inclusion of rural women in Haveli and Daund taluka of Pune district. This realisation came during the implementation of a separate project "Swachh Pani" supported by HSBC Software Development India Private Limited between 2016 and 2019. During the implementation of this project, many issues and needs of women came to the forefront. The women in this area were socially and economically neglected in the mainstream domain. It was only through Self Help Group based activities, that the women were able to make some financial savings or earnings but it was meagre.

The socio-economic inclusion of the women in this area was negligible with limited means of improving their livelihoods. This situational analysis of the women, encouraged BAIF to bring a woman centric development programme to women of this area. Addressing social and economic conditions of the women was identified as a focus area by building their capacities and giving them economic opportunities in their respective villages.

## 1.2 Pilot Study

The idea of coming up with a women centric solar drying food enterprise project began with a pilot study which was conducted 4 years back in Uruli Kanchan village with a participant strength of 15 women. Each participant was given a solar dryer.

The objective of the pilot study was to analyse the outcomes of dehydrating or drying B & C grade vegetables and fruits. The idea of using a solar based technology was to promote an eco-friendly technology which would help in reducing or eliminating the waste generated out of B-grade vegetables and fruits and at the same time producing value added products from them, agro processed using solar energy.

For the purpose of conducting the pilot study, multiple solar dehydration technologies were tested, and after trial BAIF decided on the heat conduction dryer type. The solar dehydration machine worked in the same way as any traditional drying method would work. But in this case, there was a difference in the set up and protective model design.

The traditional method mostly has a risk of contamination, nutrition loss and attack from birds and other animals. However, the improvised version, selected for this intervention was a well fabricated setup to dry food products in hygienic condition.

The solar dryer can be schematically divided into a solar cabinet with different components. The lower part is designed to hold space for a black tray at the bottom. This tray helps in trapping heat inside the cabinet, while holding the pieces of vegetables and fruit products. The cabinet is secured with a transparent polycarbonate sheet or cover which acts as a door to shut in the cabinet dryer. The polycarbonate cover acts as a UV protecting sheet, which does not allow the UV harmful rays to enter inside the cabinet. This protection layer helps in the dehydrated products to retain the nutritional content. There is gap or space created in between the polycarbonate sheet and heat absorption black tray which is known as inlet vent, this acts as a gateway to maintain the heat absorption in the cabinet.

## 1.3 Technology Application and Results

The improvised solar based technology was tested for processing the B and C grade vegetables and fruits (here processing refers to the process of dehydrating the product). The vegetables and fruits (such as onion, garlic, chikoo, etc) were sliced or chopped into pieces and later evenly spread into the black tray of the solar dryer cabinet. It was then exposed under the heat of sunlight until the food products lost its moisture content, weight and volume.

The outcomes of the experiments were impressive, the team could see the evident output changes in the products resting in the black tray for a day or two, which was loss of weight, reduction in size and increased shelf life.

The empirical results encouraged the team to research more about the quantitative and qualitative changes of the output. This led to **lab testing** of the products to check the nutritional content of each product. Evaluation on the **sensory attributes** of the products was done by volunteers and experts focusing on the parameters of the taste, colour and smell. The results from the labs were positive and encouraging enough to scale up the pilot activity into a development programme.

## 2. Scaling up the Pilot Initiative as an Enterprise Model Run by Rural Women

With the positive results of the pilot study, BAIF Development Research Foundation made plans to scale up the intervention. With the support of HSBC Software Development India Private Limited, BAIF launched the Solar Dried Enterprise Project (SDEP) in the 11 villages of Haveli and Daund taluka of Pune district.

### 2.1 Goal of the Project

The objective of the project was to empower the rural women by introducing solar Dehydration technology, which will act as a catalyst towards their economic and social empowerment. Another important component of the project was to build entrepreneurship skills of the women by strengthening the existing backward and forward linkages.

### 2.2 Inception of the Project

The project reached out to 120 rural women (coming from marginal farming background) in 11 villages of Haveli and Daund talukas of Pune district. The beneficiaries were given the support of a solar dryer, at a subsidized rate, the unsubsidized cost being covered under the SDEP project.

### 2.3 Implementation Plan

Preliminary training and sessions were conducted with the women beneficiaries to give them an overview of the solar dehydration technology. The initial phase of the project was exploratory in nature, the beneficiaries were applying the training knowledge practically on the field. This was accompanied with trial and testing and constant improvisation on the methodology of dehydration. This was a phase of cross learning and risk taking, where women were confidently coming out with their set of experiences and sharing with others.

## 3. Capacity Building as a Means to Strengthen Backward Linkages

Even though the women were building confidence on the production process for dehydrated products, there was yet more work to be done on the backward linkages for establishing a successful entrepreneurship model. For this, emphasis was given on training and capacity of the women beneficiaries.

### How capacity and capabilities were built?

- Logistic and Infrastructural support was provided for decentralised production and procurement of the products (collection, packaging, transportation etc).
- Training sessions on the cutting, chopping slicing of fruits and vegetables.
- Training on maintaining hygiene standards while carrying out the Dehydration process.
- Training on maintenance of the solar dryer cabinet.
- Exposure visits to Institutions and organizations engaged in solar Dehydration technology.
- Knowledge dissemination sessions to create awareness about the advantages of solar dehydration products.
- Upgradation in machineries to speed up the process of Dehydration (moisture meter, electric cutter, FBD Machines, artificial dryer to support the bulk orders).
- Exposure visit to wholesale vegetable markets and sabzi mandi to keep the input cost minimal.

## 4. Strengthening of Forward Linkages to Achieve Entrepreneurial Success

- Branding of the solar dried products was done with the name of “Nutrisol”.
- Linkages with Wholesale and retail customers.
- Support for bulk production transportation and logistics cost.
- Streamlining the solar dried products under standardized packaging and brand name ‘Nutrisol’.
- Linkage support through various platforms such as Urban housing societies, exhibitions, festival events, corporate office events, Malls.
- Linkage through Self Help Group Federation retail store ‘Sankalp’ in Uruli Kanchan.
- Regular monitoring and evaluation through well trained SHG federation manager.
- Promotion through Whatsapp business, Facebook page, website, pamphlet distribution, etc.
- Promotion through externally hired marketing expert.
- Marketing through Food truck Vehicle in various parts of Pune and Uruli Kanchan (post 2<sup>nd</sup> wave of covid-19).
- Personality development and marketing training through mock sessions.
- Support through aesthetic marketing strategies was provided to bring out rustic rural touch of women entrepreneurs.
- Logistic and delivery support was given to promote online sale and promotion.

## 5. Outcomes

- The outcomes of the three year long enterprise model have been very positive in terms of the phenomenal change it has brought into the women beneficiaries.
- The project has successfully achieved the objective of building the entrepreneurial capacities of the 120 women participants and many other indirect participants (such as women entrepreneurs from the SHG Federation store Sankalp).
- The exposure to different market avenues and institutions have developed confidence and motivation in the women to take it forward as livelihood option.
- The processing of the B and C grade vegetable has not only added monetary value to the produce but always helped in avoiding the food wastage, and carbon-methane emission which would have generated out of it.
- The project outcomes aligns with 9 Sustainable Development Goals.

### **SDGs which are directly or indirectly linked to the intervention**

1. GOAL 1: No Poverty
2. GOAL 2: Zero Hunger
3. GOAL 3: Good Health and well-being
4. GOAL 5: Gender Equality
5. GOAL 8: Decent Work and Economic Growth
6. GOAL 9: Industry, Innovation and Infrastructure
7. GOAL 10: Reduced Inequality
8. GOAL 12: Responsible Consumption and Production
9. GOAL 13: Climate Action

- The model has also opened a way forward for the farmers who are unable to sell their B and C grade produce.
- With this model, a product line of vegan food items has been established which is appealing to the urban and environmentally conscious customers.

Milestone in bulk sale: Recent sale of dehydrated ginger in the period of March 2021 – June 2021 has generated a gross profit of Rs. 8,70,863 (the dehydrated ginger was sold at the rate of 165 Rs./Kg which is worth Rs. 17,96,190).

**Table 1: Sales Figures from April 2020 To March 2021**

S. No.	Particular	Amount
1	Sale through SHG Federation store Sankalp	31,810
2	Individual Order sale	23,285
3	Wholesale sale	1,105,413
<b>Total Sale</b>		<b>1,160,508</b>

## 6. Key Learnings

The initiative was a challenging opportunity not only for the women beneficiaries but also for BAIF as an implementing agency, with ongoing efforts for expanding the market affected due to the Covid-19 pandemic lockdown. The production was halted, procurement was stopped and market sale was shut for a few months. However, with the easing of lockdown rules, production and marketing resumed. Home delivery and online promotion was carried out. The overall experience of establishing the enterprise model was very positive and enriching. The exploratory nature of the project made it possible to take risks, learn from the failures, and improvise at every step of implementation process. It was a participatory learning experience where the beneficiaries and team members were learning from each other's mistakes, success and journey.

## Conclusion

The solar dryer enterprise project has a great potential for expanding and engaging more and more small and marginal farmers, who are hit hard by the uncertainties of market, climate change and debt. This particular model has evolved into a perfect example of enterprise which can achieve multiple goals at the same time, be it empowering the women participants, reducing the food wastage and generating income with low investment renewable technology.