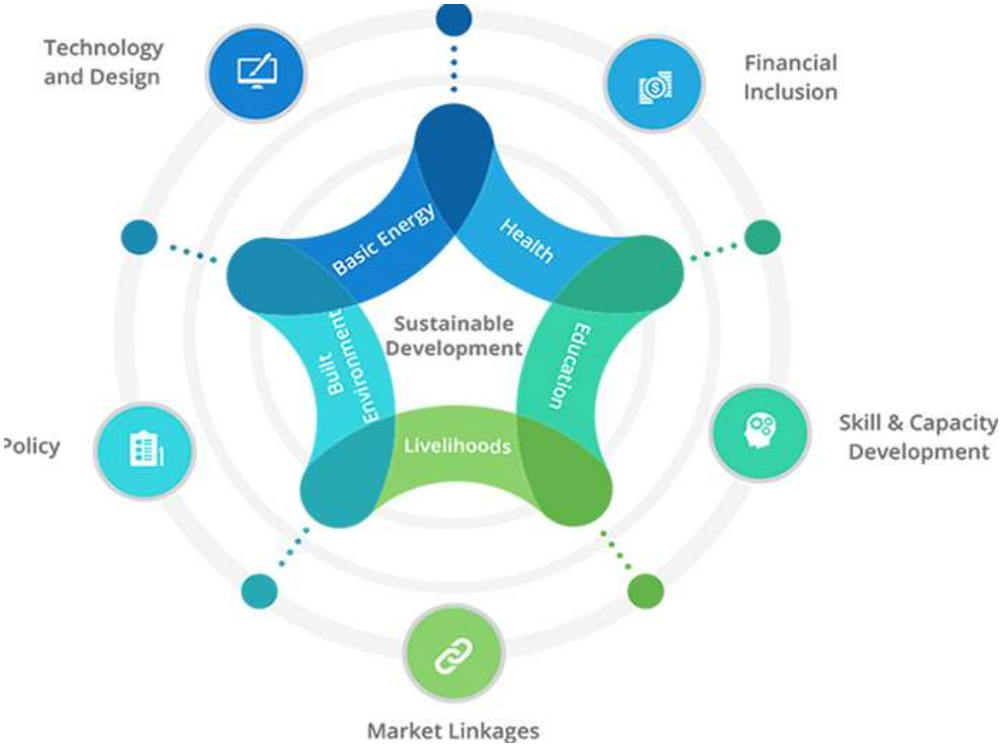

Selco Foundation

Study on Financial Models for Scalable Sustainable Energy based Livelihood Solutions for the North East Region

Draft Report

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Abbreviations

AH	Animal Husbandry
DC	Direct Current
EMI	Equated Monthly Installments
GVM	Gramya Vikash Manch
LSK	Lok Sewa Kendra
MFI	MicroFinance Institutions
NE	North East India
PoC	Point of Contact
RMB	Retail & Micro Business
RoI	Return on Investment
SDS	Sesta Development Services
SF	Selco Foundation

1. Introduction

1.1 Background

SELCO Foundation has been working towards enabling socio-economic growth in the rural livelihoods sectors by using renewable energy alternatives and developing decentralized renewable energy integrated energy efficient machinery in the technological front. A holistic ecosystem approach towards implementation of said technology involves appropriate financial linkages, studying input and output flows to enable market linkages, and enabling training and upskilling facilities for the end-users to ensure self-sustainability.

The ecosystem required for the poor to own and run livelihood assets consists of highly efficient appliances, stable market linkages and affordable financing. The biggest challenge of the three is the ability for poor families to avail financing that matches their cash flows, resulting from the sustainable energy-driven intervention. Innovations in financing livelihood assets will open a whole new world of DRE related interventions for the poor across the globe. Cash flows and links to markets differ for all types of end users, and thus, need different forms and instruments of financing. The complexity of financial products is as much as with technology innovations, if not more.

The aim of the study is to create a financial framework, placing end users on a spectrum to understand how financial models and types of financial support instruments are required for each typology of end user. Based on these recommendations, the solutions implemented can reach scale keeping in line with SELCO's unique approach.

1.2 Assam State

In Assam, agriculture is the principal occupation of the vast majority of the rural population in terms of employment and livelihood. About 90 percent of the state's population lives in rural areas and is mostly dependent on agriculture for their livelihoods. Agriculture directly or indirectly supports more than 75 percent of the population, providing employment to about 50 percent of the workforce. While the average operational holding in India is 1.10 hectare, Assam's farming families are predominantly small and marginal (85 percent) with an average land holding of only 0.63 hectare. It produces more than 50% of India's tea and 12% of oil. The per capita income Rs 6, 756 (2004-5), which is still far away from the national average. The pace of growth of Assam has not kept along with the national rate of 6%. In Assam.

Assam's Agriculture is still waiting for modernisation and the per hectare production is on lower side. Most of the areas are affected by flooding from Brahmaputra and other rivers, which majorly affect agriculture and livestock. The other major reasons for the gap are lack of market led production practices, poor commercial understanding of farmers, insufficient infrastructure at the farm level, poor transportation system, inadequate road network, lack of post-harvest infrastructure like dedicated markets, pack houses, cold storages, sorting grading lines, processing industries etc. Due to the lack of adequate

post-harvest infrastructure in the region, not only are post-harvest losses high, but dependency of farmers on intermediaries for marketing is remarkably high.

1.3 Selco Foundation

SELCO Foundation was established in 2010 with the goal to use sustainable energy solutions as a catalyst to improve quality of life and economic opportunities for the under-served.

Its mandate is three-fold;

- Pioneer and build the ecosystem to enable innovations that link sustainable energy and
  poverty reduction.
- Develop poor-centric solutions by addressing aspects of technology, financial and social linkages leading to a holistic solution that is socially, financially and environmentally sustainable.
- Through the innovations, help develop concepts and processes for other parts of the world to cater to the heterogeneous nature of poor segments.

By applying the above three mantras SELCO Foundation aims to bridge last mile gaps to deliver sustainable solutions, which innovate on replicable processes, while customizing it to site and segment for underserved communities.

1.4 Sesta Development Services

SDS (Sesta Development Services), is a professional, development organisation working in North-East and Eastern India. This is a unique organisation, which partners with the client at the field level to ensure results. The agency consists of a team of highly professional & technically qualified personnel, who have a vast and intensive experience of working at grass roots level & promotion of public owned enterprises of more than 15 years each, especially with underserved segment of the society. The agency has assisted the Central & State government agencies and other development organisations in bridging production & marketing gaps in Agriculture & allied activities in last 7 years of its existence. It is pertinent at this point to make a mention that one of the major portfolios of SDS is business incubation of small farmers.

SDS has proven competency and a dedicated (in house) team focusing on Agriculture and livestock to provide quality techno-managerial services to client. The team has been involved in a number of assignments for a large number of public sector clients and private sector entities, which involve training of farmers, developing local community service providers, setting up community-based learning centres or farmers field schools, organising and capacitating producer groups and federation for efficient market integration of the underserved. Some of the key experiences include partnerships with state governments of Assam, Mizoram, Tripura, Arunachal Pradesh, Manipur & Northeast Rural Livelihood Project (NERLP), Ministry of DoNER, GoI in developing the cadre capacity and in the implementation of the broad -based schemes on agriculture, fishery, Piggery, Nutritional Garden and poultry farming.

2. Research Methodology

2.1 Objectives of the Study

The objectives of the study area;

To define at least 5 to 6 scalable models on each of the selected solutions.

To recommend possible geographies where these models can be replicated and scaled in.

2.2 Scope of Work

a. Select the end users for the study based on a random sampling method from among the list of end users supplied.
b. To conduct **primary research** with the selected sample size to assess the real time information to create financial benchmarking of solutions;
   - To collect real time data from selected end-users on his/her livelihood / enterprise / business. This data should cover businessmodels, financial models, inputs, outputs, market linkages and other ecosystem components like financial inclusion, training and capacity building, access to schemes etc.
   - To develop end user profiles (typologies) based on their livelihood, socio-economic vulnerabilities, geographic vulnerabilities, climate risks, market linkages, support or involvement with NGOs, their existing skill sets etc. The typologies of end users would have to cover individuals, SHGs, FPOs and others.
   - Compare these primary data with the business modelling data prepared before installation (baselines and hypothesized business models) to find what was successful and what wasn't with respect to the livelihood / enterprise / business. Finally recommend the measures to be taken by the end user / SELCO Foundation /Partners / Suppliers.
   - To analyse the real time financial modelling data on each of the selected solutions and recommend its scale up model on:
     # To define what viability means
     # Whether the solution can be scaled up without subsidy from among the similar end users?
     # If subsidy is required, what is the minimum percentage of (total investment) subsidy required? Possible sources - relevant government schemes, philanthropic support etc.
     # Based on the profile of existing and potential end users, what is the maximum percentage (of total investment) the end-users can contribute? To develop a spectrum of end user profiles on this basis.
     # What is the maximum percentage of (total investment) credit that an end user can take (maximum 33% of the income can be paid as EMI) to finance the scale up model?
     # What can be the possible sources, terms, and cost (RoI) of such credit?

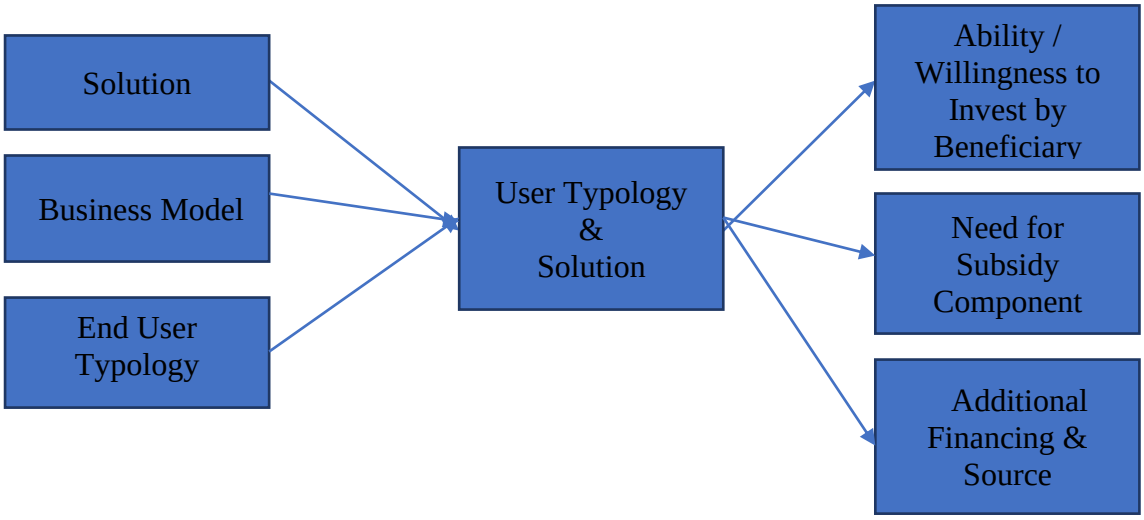
- Based on the above analysis, recommend 5-6 scalable models on each of the selected solutions.
- To recommend possible geographies where these models can be replicated and scaled in.

2.3 Approach

The broad plan for the study would comprise of the following;

Stages	Output	Remarks
Step 1	Final Tools and Sample	# Finalization of district wise sample size and research tools. # Based on additional information and discussion with field teams and suggestions on the inception presentation.
Step 2	Field data collection	# Organizing and training of field teams on study context, design, sample and tools. # Organizing system of data collection and compilation.
Step 3	Draft and Final Report	# Analysis of solution wise findings. # Recommending solution wise & user typology wise financing models. # Recommending potential financing sources for the target user groups.

2.4 Research Framework



2.5 Sampling of Districts/ Locations

The sampling of users across districts is guided by the following;

a. Districts with high number of users have been sampled under the study.

b. Each solution has been sampled across 2 districts.
c. For 11 types of solutions, an average of 5 users would be covered under the study. Wherever the number of pilot is less than 5, all the pilots would be covered under the study.

S. No.	Sectors	Name of Solution	Total	Sample
1	RMB	Blacksmith Blower	27	5
2		Sewing Machine	40	5
3		Spinning Machine	17	5
4		LSK	35	5
5		DC Fridge	7	5
6		Food Processing	2	2
7	Agri	Water Pump	39	5
8		Cold Storage	3	3
9	AH	Milking Machine	8	5
10		Egg Incubator	12	5
11		Vaccine Refrigerator	3	3
	Total		**193**	**48**

2.6 Research Instruments vis-à-vis Key Informants

A tentative list of key informants is presented in the following table:

S. No.	Key Informants	Research Instruments
1	Solution Users: Individual/ Groups/ FPOs etc	SSI/ FGD based on checklist
2	Project team members	SSI based on checklist

2.7 Key Areas of Enquiry

The key areas of enquiry for different sets of respondents is presented in the following table;

S. No.	Key Area of Enquiry	Details
	Current Users	
1	Solution	# Relevance of solution in the given geography # Enterprise potential in the given geography # Capacity and potential use of capacity # Factors impacting use of solution, its frequency, limitation of use, competition.
2	Business Model	# Comparison between projected and current models taking financing models into considerations. # Analysis of business chains i.e. backward and

		forward linkages. # Analysis of Business Eco system; financial support, trainings, access to schemes, existing skill sets, handholding support by NGOs etc
3	End User Typology	# Location of End user (Access to markets) # Livelihood profile, economic profile, major vulnerability with respect to the solution. # Reasons for use of technology
4	Willingness/ Ability to Invest	# Current financing models # Amount invested, willingness to invest with current business model # Expectation of returns against current returns.
5	Additional financing and Sources	# Source of financing utilized # Terms and condition of financing # Challenges faced in accessing finance # Sources of financing available in the region with their terms and conditions and ease of access.

3. Solution wise Findings

3.1 DC Fridge

a. Details of the samples

- Four samples were collected from the districts of Dhubri &Kamrup.

b. Details of Solution

- The solution comprises of a DC fridge with solar panel
- All four users used the intervention for keeping perishable & ready to cook & ready to eat items like: Ice creams, cold drinks, etc. The majority usage was for keeping old Drinks in the summer season in which the fridge was used max
- Previously, all the users used the conventional AC refrigerators and faced issues of interrupted cooling due to power cuts.
- Due to power cuts, there was unavailability of instant cold drinks in the area of residence/business of the mentioned users, which is now resolved by the intervention.
- The catchment of the solution was within the village & local market (at the place of business of the users)
- The users have been using the intervention since 2 to 13 months

c. Business Model

- Mostly, for all the users the business model was of small eateries/ Local kiryana shops (they used refrigerators/cooling cabinets earlier to store beverages & other perishable goods for business purposes)
- Post the adoption of solar-based intervention, there has been significant improvement in both backward & forward linkages for all the users. The supply of goods from the suppliers is increased and so is the customer base.
- The forward linkages was particularly strengthened due to regular availability & this fed into strong backward linkages
- For setting up the enterprises, all the users received grant supports. Two of them mentioned the source as Techno India.
- None of the users had access to any scheme to support the enterprise/solution

d. End User Vulnerability

- For two users, the area of location of their business was remote.

e. End User Typology

- The ownership of the intervention was individual in all the cases.
- The sources of livelihood for all the users were more or less similar, i.e., general merchandise shop, small restaurant, eateries, etc. One of them was having LSK also
- The cap of annual income for all the users was between INR 70,000 to 2.5 lacs.
- The reason for switching to this intervention was to tide over the power cut during summer season which led to patchy availability of Cold Drinks & spoilage of other items like: Ice Cream & Paneer

- The average usageper annum for all the users was 7-8 months of summer starting from: Feb to Sept

f. Financial Model

- The user expense was b/w INR 6000 to INR 10,000
- Three users financed the business through Techo India
- Two users self-financed their business (INR 30,000 each) whereas two users received a subsidy of INR 54,000 & INR 60,000
- Two users received INR 40,000 from others sources of finance.
- All the users generated a varied revenue b/w INR 70,000 to two lacs approximately by running their business
- The different costs borne by users for running their business were different. Two users paid INR 2400 per annum each for electricity bill whereas the other two users had other expenses of INR 10,000 & INR 90,000
- The Annual income before loan servicing for users varied between INR 60,000 to 2 lacs
- The overall annual income for the users ranged b/w INR 10000 to 1 lac approx.

g. Changes in Income due to Solution

- The income got diversified & new line of income added to the already running shop.
- Due to easy availability of cold beverages and other similar goods to the customers, there was an increase in sales of other items as well.
- 1 of the user's shop was in front of a school & with the availability of Cold Drinks, the sale of chips, Bhujia & Other items were increased significantly.
- In off season, Paneer & other such items are also kept in the fridge

h. Current Financing Source

- The source of financing for the intervention for two users were Techno India & for other two were Selco Foundation with the help of DIA Foundation.
- Two users availed the financing facility of INR 40,000 each whereas the other two financed INR 60,000 & INR 54000

3.2 Blacksmith Blower

a. Details of the samples

- Five samples were collected from the districts of Nalbari & Hajo (Kamrup).

b. Details of Solution

- The solution comprises of a Blacksmith Blower with solar panel
- All five users used the intervention for the purpose of heating metals
- Previously, all the users used the conventional hand-cranked fans and electric blowers
- With the help of this intervention the users could develop an efficient, reliable, cost effective source of livelihood with significantly reduced drudgery
- **The catchment of the solution was local market (at the place of business of the users)**

- The users have been using the intervention since 2 to 4 years

c. Business Model

- Mostly, for all the users the business model was of their own shop where they would purchase raw materials by themselves in order to prepare finished goods.
- In terms of backward & forward linkages, the business owners (users) sell their produce in the market or in nearby areas of their villages. The business was traditional & was practised by their family, so there was strong forward as well backward linkages
- All the users set up their enterprise on their own.
- All the users are trained in skills required for their business.
- All the users had access to schemes to support the enterprise/solution from Selco Foundation.
- The handholding support the users received was mostly from their family.

d. End User Vulnerability

- For three users, the area of location of their business was remote.

e. End User Typology

- The ownership of the intervention was individual in all the cases.
- The sources of livelihood for all the users was their own Blacksmith shop. One user had his owns farmland as well
- The cap of annual income for all the users was between INR 2.4 lacs to five lacs.
- The reason for switching to this intervention was to raise the income, reduce drudgery, increased turnover, better quality of product leading to enhanced customer satisfaction & hence increase in order & business, switch to an eco-friendly solution, as mentioned by all the users.
- The business of all the users were affected by the lockdown due to COVID-19
- The market available to the users was good in terms of consumer availability

f. Financial Model

- The average user expense for five users was b/w INR 15,000 to INR 15,500
- The five users self-financed their business (INR 15,000 each)
- All the users generated a varied revenue b/w INR 2,00,000 to five lacs approximately by running their business
- The different costs borne by users for running their business were different.

g. Changes in Income due to Solution

- The speed at which they were able to get the goods ready has increased a lot due to the adoption of the solution & a larger market is catered. Besides, due to decreased cost of replacement, better quality of product; the sale & overall turnover has increased.
- Due to the solution, there were changes in labour cost & output from the same machine, so the overall prices of the goods came down
- After switching to the intervention, there were significant changes in incomes due to change in productivity & due to diversification of finished goods

- In comparison to previous solution, this solution is less time taking, has increased productivity, and has significantly reduced drudgery by reducing fatigue

h. Current Financing Source

- **The** source of financing for the intervention for all users was self.

3.3 Cold Storage Unit

a. Details of the samples

- Three samples were collected from the districts of Baksa & Nalbari.
- For one user the intervention was not functional & hence we take into consideration the data for the other two.

b. Details of Solution

- The solution comprises of a Cold Storage Unit with solar panel
- Both users used the intervention for keeping extending shelf life of Fruits &Vegetables, etc.
- Previously, there was distress sale, as there was no mechanism for storing fresh, green fruits & vegetables resulting in huge wastage of food material
- The catchment of the solution was within the village & local market (at the place of business of the users)
- The users have been using the intervention since half year.

c. Business Model

- Mostly, for all the users the business model was of small store in which they used the intervention to store the perishable food articles, fruits, vegetables for themselves & for others on rent.
- In terms of backward & forward linkages, the users used to collect/purchase the vegetable from the cultivators or local vendors itself and the market linkages for both of them remained limited to the local ones.
- For setting up the enterprise, all the users received supports from the Selco Foundation. There were no particular skills required as such for both the users though they said they had all the expertise required for the business purpose.
- Both the users had access to scheme to support the enterprise/solution with the help of Selco foundation.

d. End User Vulnerability

- For the two users, the business was set up in Nalbari district itself & the customer base was local. There was as such no vulnerability per se.

e. End User Typology

- The ownership of the intervention was group in both the cases.
- The sources of livelihood for both the users was agriculture & the rental income they generated via the machine

- The reason for switching to this intervention was to minimise wastage, extending shelf life thereby giving better income to the producers Due to COVID-19, there was an impact on the income of the users.
- The customer base for both the users was within 5-7 kms of reach.

f. Financial Model

- The average user expense for both users was INR 25 lacs & 17 lacs respectively for setting up the business.
- Two users financed the business through GVM (MFI)

g. Changes in Income due to Solution

- This was a new intervention in hitherto new area. The producers were aware f the cold storage units but the existing units were at far away distance from their fields & with a very small quantity if produce, it didn't make sense to go to the cold storage.
- The machine proved to be a boon, as it was solar operated & with the large space (of 5 tons), they can not only store their own produce but can also help the fellow farmers & in turn can earn some income also.
- The machine was located in their vicinity hence they could put or withdraw even small quantity of produce, as they harvest.

3.4 Egg Incubator

a. Details of the samples

- Five samples were collected from the districts of Nalbari & Kamrup(R)

b. Details of Solution

- The solution comprises of an Egg incubator with solar panel
- All four users used the intervention for hatching fertile eggs successfully.
- Previously, the users were hatching their eggs by getting the bird brood over it. This result in getting lesser no. of fertile eggs (as the hen was brooding for 21 days & then rearing chicks for another 30-45 days resulting total loss of more than 2 months)
- The chicks quality was not uniform in case of brooding by the birds & moreover, the eggs are always under threat of consumption by the predators (like: Cat, Snake)
- The users adopted the intervention for more economic benefits
- The catchment of the solution was within the village & local market (at the place of business of the users)
- The users have been using the intervention since 6- 7 months
- One of the user has got the machine installed but it was not operationalized yet

c. Business Model

- The business model for all the users is to buy fertile eggs & supplement feeds (for the poultry chicks) and selling the ready chicks.
- Another business model was contract Hatching. In this case, there was rent income. But this income was very patchy, as hatching two different species/ different age eggs resulted in lower hatching % & poor quality of chicks. Besides, its very difficult to schedule the batch, as everyone in the village is getting eggs at different time &

hence the different hatching schedule also. This result in inefficient usage of the machine

- Post the adoption of solar-based intervention, there has been significant improvement in both backward & forward linkages for all the users.
- For setting up the enterprises, all the users received Support from NGO.
- None of the users had access to any scheme to support the enterprise/solution
- To users had support from family & local SF partners (Dia Foundation) in terms for hand holdings

d. End User Vulnerability

- For four users, the area of location of their business was remote.

e. End User Typology

- The ownership of the intervention was individual in four cases & group in one of the case.
- The sources of livelihood for all the users was own farmlands & shops
- The cap of broad annual income for all the users was between INR 50,000 to 2.5 lacs.
- The reason for switching to this intervention was to increase income from more eggs by the hen, better quality of chicks & rent income
- The users had to face difficulty in COVID-19 due to lockdown.
- The catchment for the solution was local customer base only.

f. Financial Model

- Four users financed the business through Diya Foundation whereas one via Bandhan Bank.
- Four users self-financed some amount for their business (INR 10,000 each) and one user paid INR 60, 0000.
- All of them received a subsidy of INR 90,000.
- None of them received funds from any other sources.
- All the users generated a varied revenue b/w INR 20,000 to one lac approximately by running their business
- The different costs borne by users for running their business were different. It varied between INR 3000 to INR 30,000

g. Changes in Income due to Solution

- This is a new solution to most of the user.
- The users are readjusting the business model, as per their own & unique socio-economic context.
- The income source is diversified & the risk has been significantly reduced for the community.
- Though the solution is owned by one of the member, the whole community is accruing the benefits.

h. Current Financing Loan

- **The** source of financing for the intervention for four users was DIA Foundation. One user financed with the help of the Bank.

- The amount financed by all the users ranged b/w INR 60,000 to INR 1 lac.

3.5 Food Processor

a. Details of the samples-

- Two samples were collected from the districts of Nalbari

b. Details of Solution

- The solution comprises of a Food Processor with solar panel
- Both the users used the intervention for making food items like chips & other snacks.
- Previously, one of the users made food articles via different means, mostly handmade.
- This technology has reduced the drudgery & increase the productivity as well production
- The catchment of the solution was within the village & local market (at the place of business of the users)
- The users have been using the intervention since 6- 7 months

c. Business Model

- For one of the users, backward & forward linkages have somewhat improved. The user sells the produce in the local market & to the local hawkers. The other user is still dealing with the practical details of the initial stages of the business.
- However the market linkages remained limited to local areas for the users
- For setting up the enterprises, all the users received grant supports. Two of them mentioned the source as Techno India.
- None of the users accessed any scheme to support the enterprise/solution

d. End User Vulnerability

- For two users, the area of location of their business was remote.

e. End User Typology

- The ownership of the intervention was individual in one case and group in the other one.
- The sources of livelihood was their own business of supplying food articles to the hawkers, small shops, eateries etc.
- The annual income for one of the users was INR 540000.
- The reason for switching to this intervention was to increase the income as mentioned by all the users.
- The users' business was affected by COVID-19

f. Financial Model

- The source of financing for both the users was Selco Foundation.
- One users received funds from an unnamed source (INR 20, 15,280). Also, the revenue & the costs mentioned for running the business by the same user is INR 720000 & INR 540000
- The income mentioned the user was INR 180000

g. Changes in Income due to Solution

- The productivity has increased resulting in better turnover.
- The labour cost has income down significantly leading to better margins
- The solution has reduced the dependence of the user on the labour. One of the key aspect of the industry was heavy dependence on the skill of labour. The machine has levelled the playing field, whereas even a semi killed worker or a new worker with a little orientation & Training can work as much as a skilled labour with the help of the machine & this has significantly reduced the risk of labour replacement.
- After switching to the intervention, there were significant Changes in incomes due to change in productivity, decrease in the labour costs & input costs. Physical labour was also lessened for one of the users.

h. Current Financing Loan

- The source of financing for the intervention for one of the user was Selco Foundation & he/she availed the financing facility of INR 20 lacs approximately.

3.6 LSK

a. Details of the samples

- Five samples were collected from the districts of Dhubri, Sonitpur & Kamrup.

b. Details of Solution

- The solution comprises of a LSK with solar panel
- All five users used the intervention for Photocopy & printing purposes.
- Previously, three users used normal battery with invertors, one used electricity & the last user did not use the any technology for facilitating the printing business.
- The catchment of the solution was within the village & local market (at the place of business of the users)
- The users have been using the intervention for around 1.5-6 years.

c. Business Model

- Mostly, for all the users the business model was of their own shops of photocopy & printing.
- There are mostly local customers for all the users in terms of forward linkages. Market linkages are also limited to the local areas.
- However there were no strengthened linkages for any of the users
- For setting up the enterprises, one of the user received support from the Selco Foundation

d. End User Vulnerability

- For one, the area of location of their business was remote.

e. End User Typology

- The ownership of the intervention was individual in all the cases.

- The sources of livelihood for all the users was their own shop of photocopy & printing.
- The broader cap of annual income for all the users was between INR 60,000 to two lacs.
- The reason for switching to this intervention was to add to the existing income as mentioned by all the users.
- COVID-19 affected the business of all the users.
- The market base available to most users here was not satisfactory. One of the users depended on the income from the govt institutions & schools

f. Financial Model

- The average user expense for three users was b/w INR 11,000 to INR 30,000
- Four users self-financed their business (INR 30,000 each) whereas one of the users received a subsidy of INR 20,000
- Three users generated a varied revenue b/w INR 1-1-.5 lacs approximately by running their business
- The different costs borne by users for running their business were different. Three users paid INR 30,000-60,000 per annum each for the same
- The overall annual income for the users ranged b/w INR 10000 to 1 lac approx.

g. Changes in Income due to Solution

- With the un-interrupted & Dependable power supply with almost zero cost, they were able to reduce price & render services at even odd times. This has significantly build the trust of the community & they have reduced going to large urban centres for such services. This has also increased the turnover.
- After switching to the intervention, there were significant Changes in incomes due to change in productivity, decrease in input & labour costs.
- Diversified sources also brought increased income for all the users.

h. Current Financing Loan

- The source of financing for the intervention for two users was Selco Foundation. The rest of them did self-financing. (one user mentioned the amount as INR 48,000)

3.7 Milking Machine

a. Details of the samples-

- Four samples were collected from the districts of Dhubri & Nalbari.

b. Details of Solution

- The solution comprises of a Milking Machine with solar panel
- All four users used the intervention for milking cattle's to yield high quality untouched milk.
- Previously, all the users used the conventional method of manual milking.
- Earlier a lot of physical work was required in milking, which increased the labour costs, which is now resolved by the intervention.
- The catchment of the solution was within the user's home & at max within the village

- The users have been using the intervention since last 3 to 18 months

c. Business Model

- Milking is one of the most time consuming & tedious task in dairying. Moreover, milking is also a skilled job. With the introduction of machine, the labour cost came down significantly as well the dependence on skilled labour was reduced to a great extent.
- Generally, these business owners supply the milk to big dairies/outlets; however, they sell their produce to local people as well. However, as mentioned by them, the local customers prefer to buy the products from the dairy outlets and not from them. With the introduction of machine, the quality of milk will improve & the producers stand to get better price in future from the large diaries.
- For setting up the enterprises, all the users received support from Selco Foundation.
- All the users had access to schemes to support the enterprise/solution
- No handholding support was taken by any of them from anyone.

d. End User Vulnerability

- For three users, the area of location of their business was remote.

e. End User Typology

- The ownership of the intervention was individual in three cases & group in one.
- The sources of livelihood for all the users were farming and cultivation apart from the milking business
- The broad cap of annual income for all the users was between INR 1.5 to 15 lacs approx.
- The reason for switching to this intervention was to reduce drudgery & better the quality of milk as well add to the annual income (by renting the machine), as mentioned by all the users.
- Lockdown due to covid-19 and poor market linkages affected all the users.

f. Financial Model

- The average user expense for three users was b/w INR 50,000 to INR 1.5 lacs approx.
- The users financed the business through Selco Foundation (partially)
- Three users self-financed their business (INR 30,000 each)
- The three users received a subsidy of INR 1 lacs, 1 lac & 19,000 respectively.
- All the users generated a varied revenue b/w INR 1 to 15 lacs approximately by running their business
- The different costs borne by users for running their business were different. The expenses varied b/w INR 15000 to INR 72000

g. Changes in Income due to Solution

- After switching to the intervention, there were Changes in incomes due to change in productivity, and lower labour costs.
- With more time in hand, the rearers are able to devote more attention to their animal stock & they are also planning to increase the herd size, as one of the major bottleneck is removed.

- Reduction in physical labour due to manual milking is one of the key offerings the intervention has made to all the users.

h. Current Financing Loan

- **The** source of financing for the intervention for all the users was Selco Foundation.
- The financing facility availed by all raged between INR 19000 to INR 1 Lac.

3.8 Sewing Machines

a. Details of the samples

- Five samples were collected from the districts of Dhubri, Nalbari & Kamrup.

b. Details of Solution

- The solution comprises of a Sewing machine with solar panel
- All the users used the intervention for sewing purposes.
- Previously, all the users used the conventional sewing machines that either required physical support or was run by AC motors via electricity
- To increase the productivity and efficiency the users made a switch to the intervention.
- The catchment of the solution was individual user along with 2-3 trainees for the some users,
- The users have been using the intervention since 7-24 months

c. Business Model

- Mostly, for all the users the business model was of big or small sewing outlets where they either would take the orders from the customers or would invest in clothes & raw material to make final products for selling.
- The market reach was mostly limited to the local area for all the users.
- The forward linkages was strengthened due to better quality of stitch, faster turnaround & introduction of new designs.
- For setting up the enterprises or access to schemes, all the users received grant from Selco & Diya Foundations.
- The handholding support was provided by Diya foundation in 2 cases.

d. End User Vulnerability

- For two users, the area of location of their business was remote.

e. End User Typology

- The ownership of the intervention was individual in all the cases.
- The other sources of livelihood for all users were farming, other businesses & mason shops apart from Sewing.
- The cap of annual income for all the users was between INR 1 to four lacs.
- The reason for switching to this intervention was to increase the income & reduce drudgery as mentioned by four users.
- The Lockdown due to COVID-19 affected all the users in their business.
- Market base for four users was good.

f. Financial Model

- The average user expense for three users was b/w INR 4000 to INR 13,000
- One of the user self-financed the amount of INR 13000, the rest were given subsidies ranging from INR 6000 to 11000 except one.
- All the users generated a varied revenue b/w INR 40000 to 3 lacs approximately by running their business
- The different costs borne by users for running their business were different. Which ranged from INR 40000 to INR 80000 across all the users.
- The overall annual income for the users ranged b/w INR 1 to 3 lacs approx.

g. Changes in Income due to Solution

- After switching to the intervention, input costs changed for all the users. As the intervention was now facilitated with a DC motor, there was an increase in the productivity and reduction in the physical work required.
- The stitch quality was also improved & they were able to offer new designs
- The users are able to deliver better results with lesser fatigue.
- With the better quality of work, the demand of the local work has increased & they may even thinking of charging premium in future.

h. Current Financing Loan

- **The** source of financing for the intervention for two users were DIA Foundation (INR 11,000 each) and for one was Selco Foundation, (INR 6000_. two users did self-finance (INR 13000 & INR 25000).

3.9 Spinning Machine

a. Details of the samples-

- Five samples were collected from the district of Sonitpur

b. Details of Solution

- The solution comprises of a Spinning Machine with solar panel
- All five users used the intervention for preparing cotton roving in to workable yarn or thread.
- Previously, all the users used the conventional tools and prepared the thread manually.
- They all collectively opted for this intervention because it was time & labour saving
- The catchment of the solution was local market & NGO MASK
- The users have been using the intervention for 19 months

c. Business Model

- All the users were affiliated to the NGO (MASK) for preparing the end product (thread) from the raw materials bought in the form of Cocoons.
- Either the users were given bulk order by the NGO for thread preparation or they themselves invested in buying cocoon to prepare threads and sell on there own.

- Talking about the market linkages, the users mostly had limited access to other vendors apart from the NGO.
- For setting up the enterprises, all the users received the financial support from the mentioned NGO and also got trained from the NGO and Handloom department
- All the users had access to any scheme to support the enterprise/solution which was with the help of the NGO. All of them availed handholding support as well.

d. End User Vulnerability

- The area of location of their business was remote.

e. End User Typology

- The ownership of the intervention was group in all the cases.
- The sources of livelihood for all the users were mostly doing other household chores apart from the spinning business.
- The socio-economic factors, COVID-19, and remote geographic location diminished the access of the users to the market.
- The catchment for the solution was only local market.
- The average usage per day for all the users was 6-7 hours.

f. Financial Model

- All the users had received an approx. Amount of INR 25000(collectively)
- All the users generated a varied revenue of INR 80000-90000 approximately by making threads
- The overall annual income for the users was around INR 70,000 approximately

g. Changes in Income due to Solution

- Input costs & labour costs seemed to be reduced along with the drudgery as the intervention proved to be more efficient & time effective than the manual tools of thread making.
- Better organization of the spool resulting in lesser losses

h. Current Financing Source

- **The** source of financing for the intervention for all the users was NGO MASK.
- **The NGO** provided the machinery to the users and gave them a pay of INR 1000 per kg each of cotton threads they would produce.

3.10 Vaccine Fridge

a. Details of the samples

- Two samples were collected from the districts of Dhubri &Baksa.

b. Details of Solution

- The solution comprises of a Vaccine fridge with solar panel
- All two users used the intervention for keeping the vaccine safe in rural areas by putting it at optimum temperature.
- Previously, the users used the Ice lined refrigerator for the same.

- Safety controls & constant temperature maintenance are the feature given by the intervention. The users also mentioned a low shipment cost as one of the factors.
- The catchment of the solution was local sub centre areas & local health facilities.
- The intervention is being put to use for 8-12 months

c. Business Model

- One of the users mentioned about storing the essential medication in the vaccine fridge to prevent them from the spoilage.
- The other mentioned that it received special instructions/training for the purpose of operating the same device.

d. End User Vulnerability

- This section is somewhat invalid keeping in mind the type of intervention is used.

e. End User Typology

- The ownership of the intervention was individual in all the cases.
- The sources of livelihood for all the users were more or less similar, i.e., general merchandise shop, small restaurant, eateries, etc.
- The cap of annual income for all the users was between INR 70,000 to 2.5 lacs.
- The reason for switching to this intervention was to add variety to the existing products as mentioned by all the users.
- The machine was used across the year

f. Financial Model

- N/A

g. Changes in Income due to Solution

- As the solution was installed with users who has never used such thing, so there is no change in income rather a new stream of income has been added.

h. Current Financing Loan

Selco foundation has extended a subsidy & line of credit.

3.11 Water Pump

a. Details of the samples

- Five samples were collected from the districts of Nalbari & kamrup.

b. Details of Solution

- The solution comprises of a Water pump with Solar Panel
- All five users used the intervention for watering their fields,
- Previously, all the users used the conventional methods of irrigation.
- Low cost of operation, ease of usage & efficiency of the intervention made the users switch to this solution
- The catchment of the solution is the farmers field & adjacent fields
- The users have been using the intervention for 6-9 months

c. Business Model

- Post the adoption of solar-based intervention, there has been significant improvement in the produce of rice & vegetables for all the users. The users are now able to sell more of seasonal produce & earn more.
- The local market linkages remain constant
- For setting up the enterprises, all the users received financial supports & access to scheme to support the enterprise/solution

d. End User Vulnerability

- For most users, the area of location of their farm lands was remote.

e. End User Typology

- The ownership of the intervention was individual in 2 cases & group in three.
- Agriculture was the main source of income for all the users.
- The cap of annual income for all the users was between INR 50,000 to 3 lacs.
- The reason for switching to this intervention was to harness water resources at the time of irrigation efficiently.
- The lockdown during COVID-19 affected the sales of seasonal produce of all the respondents.

f. Financial Model

- The average user expense for two users was around INR 35000
- The users received some amount from others sources of finance- CINI sustain Plus
- All the users generated a varied revenue b/w INR 50,000 to three lacs approximately by running their business
- The different costs borne by users for using the intervention was different which ranged around INR 10,000-20000 annually
- The Annual income before loan servicing for users varied between INR 20,000 to 2.5 lacs approx.
- The overall annual income for the users ranged b/w INR 40000 to 2 lac approx.

g. Changes in Income due to Solution

- The intervention was time & cost effective & reduced physical labour and hence drudgery. It reduced fatigue of the users.
- The dependence on electricity has reduced significantly & consequently the bill.
- The intervention has not only helped the user but also other user in the area.
- Since lesser physical work was required, there was reduction in labour cost. The solar enabled technology reduced the input cost on the intervention as well.
- With more time in hand & lesser drudgery, the farmers were able to pay more attention to their fields & improve the production

h. Current Financing Loan

- The source of financing for the intervention for three users were CINI sustain & for other two were Selco Foundation (partially)

- The three users availed the financing facility of INR 14,65,000 each with the help of CINI Sustain Plus.

4. Financing Options

The sources of financing commonly accessed by the sampled users and available in their geographies comprise of SHGs, MFIs and regular Banks. The conditionalities of financing with their availability is presented below;

a. Self Help Groups

- **Limit of Finance:** Though it is dependent upon the stage of maturity of the SHG and is entirely upto its members, the limit for financing is usually upto INR 50, 000. The other factors that influence the limit is the creditability of the User based on servicing of past loans from the group.
- **Duration of Finance:** This again is flexible and is based on the requirement of the User and decision by members of the SHG. However, most of the loans are for 24 to 36 months only.
- **Rate of Interest:** The rate of interest in an SHG is usually charged at 2% per month or 24% per year.
- **Need for Collateral:** There is no system of collateral in case of SHG. The loan conditionalities, however, are defined based on past performance in loan servicing and current status of the loanee.
- **Ease of Access:** With availability of funds with the SHG/ federation, the access to loans is only conditional to the decision by the members.
- **Coverage by SHG:** Though depends entirely upon presence of SHG in a region, it is potential source of loans especially for interior areas.

b. Micro Finance Institutions (Grameen, Sahara, Ujjivan, Bandhan)

- **Limit of Finance:** Though it is dependent upon the stage of maturity of the group the limit for financing is usually upto INR 25, 000. The other factors that influence the limit is the creditability of the User based on servicing of past loans from the group.
- **Duration of Finance:** The loans in case of MFIs is usually extended for a shorter period of time and varies mostly between 12 and 24 months only.
- **Rate of Interest:** The rate of interest in case of an MFI is higher as they charge a flat rate of about 18% till the loan ends without considering the reducing principal amount.
- **Need for Collateral:** There is no system of collateral in case of MFI. The loan size is dependent upon the past performance of the group/ individual.
- **Ease of Access:**If the User is a member of an MFI group, there is system to access loan. The process takes between 15 days to a month.
- **Coverage by MFI:**MFI usually operate in cluster of villages which are easily accessible from a central location like a block.

c. Mudra Loan from Bank

- **Limit of Finance:** The limit for financing is upto INR 2, 00, 000. This loan is extended against a business plan.
- **Duration of Finance:** The loans in this case is upto 36 months.
- **Rate of Interest:** The rate of interest in case of this loan is about 7%.
- **Need for Collateral:** There is no need for a collateral upto an amount of INR 1, 00, 000.
- **Ease of Access:** In case of loan sizes upto INR 50, 000, not mchpaper work is required.
- **Coverage by Banks:**The Bank branches are usually limited till the Block level/ local town level at the most. Also, interior regions might have limited coverage.

5. Financial Models

The following financial models have been developed taking into account the following factors;

a. **Source of finance:** This covers the terms and conditions of the financing source/ financial institution. The major sources identified and covered for financial modeling are SHGs, Banks and MFIs.

b. **Down payment:** With a down payment of 20% and without a down payment

Model No.	Source of Finance (DC Fridge)	Amount	Down Payment	Average Monthly Income	Max amount as EMI	EMI Amount	Comment on Subsidy	Interest %	Duration
1	SHG (with down payment of 20%)	100000	20000	12917	4306	3139	Not Required	24%	36 Months
2	SHG (without down payment)	100000	0	12917	4306	3923	Not Required	24%	36 Months
3	Bank (with down payment of 20%)	100000	20000	12917	4306	3582	Not Required	7%	24 Months
4	Bank (without down payment)	100000	0	12917	4306	4477	Marginal Case	7%	24 Months
5	MFI (with down payment of 20%)	100000	20000	12917	4306	4512	Marginal Case	18%	24 Months
6	MFI (without down payment)	100000	0	12917	4306	5636	23200	18%	24 Months

Model No.	Source of Finance (Cold Storage)	Amount	Down Payment	Average Monthly Income	Max amount as EMI	EMI Amount	Comment on Subsidy	Interest %	Duration
1	SHG (with down payment of 20%)	1400000	280000	8000	2667	43941	1053000	24%	36 Months
2	SHG (without down payment)	1400000	0	8000	2667	54926	1333000	24%	36 Months
3	Bank (with down payment of 20%)	1400000	280000	8000	2667	50145	1060000	7%	24 Months
4	Bank (without down payment)	1400000	0	8000	2667	62682	1340000	7%	24 Months
5	MFI (with down payment of 20%)	1400000	280000	8000	2667	63140	1073000	18%	24 Months

6	MFI (without down payment)	1400000	0	8000	2667	78924	1353000	18%	24 Months

Model No.	Source of Finance (Egg Incubator)	Amount	Down Payment	Average Monthly Income	Max amount as EMI	EMI Amount	Comment on Subsidy	Interest %	Duration
1	SHG (with down payment of 20%)	175000	35000	3400	1133	5493	110000	24%	36 Months
2	SHG (without down payment)	175000	0	3400	1133	6866	145000	24%	36 Months
3	Bank (with down payment of 20%)	175000	35000	3400	1133	6268	115000	7%	24 Months
4	Bank (without down payment)	175000	0	3400	1133	7835	150000	7%	24 Months
5	MFI (with down payment of 20%)	175000	35000	3400	1133	7892	120000	18%	24 Months
6	MFI (without down payment)	175000	0	3400	1133	9863	155000	18%	24 Months

Model No.	Source of Finance (Food Processing)	Amount	Down Payment	Average Monthly Income	Max amount as EMI	EMI Amount	Comment on Subsidy	Interest %	Duration
1	SHG (with down payment of 20%)	300000	60000	15000	5000	9416	172000	24%	36 Months
2	SHG (without down payment)	300000	0	15000	5000	11770	232000	24%	36 Months
3	Bank (with down payment of 20%)	300000	60000	15000	5000	10745	110000	7%	24 Months
4	Bank (without down payment)	300000	0	15000	5000	13432	170000	7%	24 Months
5	MFI (with down payment of 20%)	300000	60000	15000	5000	13532	210000	18%	24 Months
6	MFI (without down payment)	300000	0	15000	5000	16912	270000	18%	24 Months

Model No.	Source of Finance (LSK)	Amount	Down Payment	Average Monthly Income	Max amount as EMI	EMI Amount	Comment on Subsidy	Interest %	Duration
1	SHG (with down payment of 20%)	90000	18000	10317	2825	2825	Not Required	24%	36 Months
2	SHG (without down payment)	90000	0	10317	3439	3531	Marginal Case	24%	36 Months
3	Bank (with down payment of 20%)	90000	18000	10317	3439	3224	Not Required	7%	24 Months

4	Bank (without down payment)	90000	0	10317	3439	4030	12000	7%	24 Months
5	MFI (with down payment of 20%)	90000	18000	10317	3439	4060	11000	18%	24 Months
6	MFI (without down payment)	90000	0	10317	3439	5072	29000	18%	24 Months

Model No.	Source of Finance (Milking Machine)	Amount	Down Payment	Average Monthly Income	Max amount as EMI	EMI Amount	Comment on Subsidy	Interest %	Duration
1	SHG (with down payment of 20%)	55000	11000	13396	4465	4496	Not Required	24%	36 Months
2	SHG (without down payment)	55000	0	13396	4465	4280	Not Required	24%	36 Months
3	Bank (with down payment of 20%)	55000	11000	13396	4465	4542	Not Required	7%	24 Months
4	Bank (without down payment)	55000	0	13396	4465	4406	Not Required	7%	24 Months
5	MFI (with down payment of 20%)	55000	11000	13396	4465	4312	Not Required	18%	24 Months
6	MFI (without down payment)	55000	0	13396	4465	4476	Not Required	18%	24 Months

Model No.	Source of Finance (Sewing Machine)	Amount	Down Payment	Average Monthly Income	Max amount as EMI	EMI Amount	Comment on Subsidy	Interest %	Duration
1	SHG (with down payment of 20%)	30000	6000	10033	3344	2940	Not Required	24%	36 Months
2	SHG (without down payment)	30000	0	10033	3344	3675	Not Required	24%	36 Months
3	Bank (with down payment of 20%)	30000	6000	10033	3344	2745	Not Required	7%	24 Months
4	Bank (without down payment)	30000	0	10033	3344	3431	Not Required	7%	24 Months
5	MFI (with down payment of 20%)	30000	6000	10033	3344	3020	Not Required	18%	24 Months
6	MFI (without down payment)	30000	0	10033	3344	3384	Not Required	18%	24 Months

Model No.	Source of Finance (Spinning Machine)	Amount	Down Payment	Average Monthly Income	Max amount as EMI	EMI Amount	Comment on Subsidy	Interest %	Duration
1	SHG (with down payment of 20%)	35000	7000	5950	1983	2062	Not Required	24%	36 Months

2	SHG (without down payment)	35000	0	5950	1983	2057	Not Required	24%	36 Months
3	Bank (with down payment of 20%)	35000	7000	5950	1983	1955	Not Required	7%	24 Months
4	Bank (without down payment)	35000	0	5950	1983	2054	Not Required	7%	24 Months
5	MFI (with down payment of 20%)	35000	7000	5950	1983	1968	Not Required	18%	24 Months
6	MFI (without down payment)	35000	0	5950	1983	1972	Not Required	18%	24 Months

Model No.	Source of Finance (Vaccine Refrigerator)	Amount	Down Payment	Average Monthly Income	Max amount as EMI	EMI Amount	Comment on Subsidy	Interest %	Duration
1	SHG (with down payment of 20%)	145000	29000	6000	2000	4551	95000	24%	36 Months
2	SHG (without down payment)	145000	0	6000	2000	5689	124000	24%	36 Months
3	Bank (with down payment of 20%)	145000	29000	6000	2000	3582	80000	7%	24 Months
4	Bank (without down payment)	145000	0	6000	2000	4477	109000	7%	24 Months
5	MFI (with down payment of 20%)	145000	29000	6000	2000	6540	110000	18%	24 Months
6	MFI (without down payment)	145000	0	6000	2000	8176	139000	18%	24 Months

Model No.	Source of Finance (Water Pump)	Amount	Down Payment	Average Monthly Income	Max amount as EMI	EMI Amount	Comment on Subsidy	Interest %	Duration
1	SHG (with down payment of 20%)	250000	50000	9583	3194	7847	118000	24%	36 Months
2	SHG (without down payment)	250000	0	9583	3194	9808	168000	24%	36 Months
3	Bank (with down payment of 20%)	250000	50000	9583	3194	8955	128000	7%	24 Months
4	Bank (without down payment)	250000	0	9583	3194	11193	178000	7%	24 Months
5	MFI (with down payment of 20%)	250000	50000	9583	3194	11276	143000	18%	24 Months
6	MFI (without down payment)	250000	0	9583	3194	14092	193000	18%	24 Months

Model No.	Source of Finance (Black Smith Blower)	Amount	Down Payment	Average Monthly Income	Max amount as EMI	EMI Amount	Comment on Subsidy	Interest %	Duration
1	SHG (with down payment of 20%)	15000	3000	17616	5872	4161	Not Required	24%	3 Months
2	SHG (without down payment)	15000	0	17616	5872	3939	Not Required	24%	4 Months
3	Bank (with down payment of 20%)	15000	3000	17616	5872	4047	Not Required	7%	3 Months
4	Bank (without down payment)	15000	0	17616	5872	3805	Not Required	7%	4 Months
5	MFI (with down payment of 20%)	15000	3000	17616	5872	4176	Not Required	18%	3 Months
6	MFI (without down payment)	15000	0	17616	5872	4008	Not Required	18%	4 Months

6. Potential Geographies

The following sections discusses the criteria for selection of geographies where these models can be replicated and scaled in. As mapping of geography was beyond the scope of the assignment, criteria for selection of geographies have been developed based on the current user covered as sample. The criteria take into consideration the geographies where need for such solutions is very high but solution itself might not be feasible, financially, and require a strong subsidy support for scale up.

S. No.	Solutions	Criteria for Selection of Location	Remarks
1	DC Fridge	# High power cuts # Commercial area (shops/ restaurants) with high foot fall and requirement for keeping items cold like cold drinks, food material etc # Preferably small towns, local markets on travel routes.	The cost of DC fridge is substantially higher to a regular fridge. The user for a fridge would be a small kirana shop, restaurants etc. DC Fridge is a solution for places with high power cuts.
2	Cold Storage	# high Production of vegetables or milk products # Remote locations where access to electricity & market is low	Cold storage as a solution is applicable for regions where there is high production of products like vegetables/ fruits, fish, milk etc and witnesses relatively high wastage/ low returns due to low shelf life of the produce
3	Egg Incubator	# Large population of Poultry (Country birds, Dual purpose Poultry, Duck, Quail etc.) # Remote locations where there is poor connectivity to the chicks supply centre # Poor quality chicks availability	Egg incubator is suitable for locations, where there is large population of poultry (Country birds, Quails, Duck etc.) & with poor connectivity. Due to poor connectivity, the chicks quality suffers a lot. High population of poultry will make sure that the machine is run optimally
4	Food Processing	# Medium scale processing (household or industrial) # Labour intensive practices offer scope for replacement of manual equipments with mechanical ones	The food processing machine is suitable for locations where there is medium scale of operations (as low scale will not cover the cost) & poor electricity supply. Large market shall be an added advantage as with the increasing efficiency & speed, the

		# Large Market with scope for expansion # Poor electricity supply	market shall absorb the extra produce
5	LSK	# Small Towns where there is school & block/ district centre is far # Remote locations # Poor electricity supply	The LSK (Lok Sewa Kendra) is suitable for locations which are at a distant from nearby block & have poor connectivity. Most of the farmers or villagers who are visiting the block/district office, shall need the documents ready in their hands. Locations with poor electricity supply will also make a good case, as internet is also required for connecting with the servers
6	Milking Machine	# High population of milch (milk yielding) animals # High milk output # High density of large farmers (with milch animals holding >5) # Labour is short/ costly # Area with MCC (Milk Collection Centre)	The milking machine could replace the skilled labour which milk the cows. Farmers with large no. milch animals employ extra labour for milking & also pay a good amount. The machine could replace the skilled workers & efficiently get the work done with good quality if milk. More suitable for the area, where the large farmers are pouring milk to some MCC (Milk collection centre), as the MCC monitors the milk quality closely & better quality if milk (no human/ organic touch) can fetch the farmers better price
7	Sewing Machine	# Remote locations # High density work	The solar powered sewing machine is suitable for locations where already there is electric sewing machine & there is poor electricity supply. These type of entrepreneurs shall promptly pick the machine up. Another target group could be the entrepreneur with advance age & high demand in local area. Due to advance age, they might not like to undergo physical drudgery & owing to high demand, shall have high return & hence shall prefer solar powered machine.
8	Spinning Machine	# Cocoon producing units # Large knitting centres #NGOs or SHGs working on	The spinning machine will be suitable at a place where there is large production of cocoon or large

		Cocoon production/ spinning	knitting centre. As the solar unit could support 2/3 machines, for individual it may not be of much use. Any social sector organisation or SHG (or any sort of collective) working on cocoon production or spinning from cocoon could be the right target.
9	Vaccine Refrigerator	# High animal population (Dairy animals, Small ruminants like Sheep & Goat, Poultry etc.) # Lack of Veterinary extension services # Area with good animal husbandry practices (High awareness on vaccination)	With high awareness on vaccination & improving infrastructure, it may not be much useful for human vaccine but definitely very useful for animal vaccines. Remote locations with large animal population shall be the ideal target group
10	Water Pump	# High density Paddy producing area (at least 2 crops in a year) or winter paddy producing area # Poor electricity supply area # Large farmers (with large land holding) # Poor irrigation facilities # Farmers with commercial agriculture practices	The solar powered water pump shall be preferred by the farmers with high paddy production (at least 2 crops in a year), large landholding, commercial agriculture & winter paddy (as irrigation facilities lacks in winter season more than in summer season)
11	Blacksmith Blower	# High landholding # Large agriculture centres # Haat Bazaar area	The blacksmith blower shall be most suitable where there is high landholding, as farmers with large handholding shall require more equipment & would prefer to forge them or repaired at local shopkeepers. Large agriculture centres shall be suitable, as there is large no. of farmers & hence more demand of equipments. Haat bazaar area is preferred as there is more footfall of the customers who are looking forward to get there equipment repaired or buy new equipments.

7. Conclusions

7.1 Financial Models

The calculation for the need for subsidy is based on the current income of the user taking average of the samples covered for each solution. Though, some of the samples also cover users who are in a vulnerable state and is also reflected in their income levels, the same has been average with regular users of solution.

The calculation for the need of subsidy for most of the solutions is very clear in terms of needed or not needed and this would not change in case of marginal change in income levels. However, there are certain solutions which are borderline cases and the same would require to be specifically reviewed if there are changes in the income levels across the various model factors.

Model No.	Source of Finance	Amount	Comment on Subsidy
1	DC Fridge	100,000	In one case 23,200
2	Cold Storage (5Mt)	14,00,000	10,53,000 to 13,53,000
3	Egg Incubator (300)	175000	110,000 to 155,000
4	Food Processing	300000	172,000 to 270,000
5	LSK	90000	12,000 to 29,000
6	Milking Machine (Single cluster)	55000	Not Required
7	Sewing Machine	30000	Not Required
8	Spinning Machine	35000	Not Required
9	Vaccine Refrigerator	145000	80,000 to 139,000
10	Water Pump	250,000	118,000 to 193,000
11	Blacksmith Blower (15-20)	15000	Not Required

7.2 Potential Geographies

The criteria for selection of geographies for replication of DRE models/ solution is majorly to ensure (a) demand and (b) financial feasibility of the solution for the User. The broad factors to ensure the same are as follows;

- Poor electricity supply/ frequent power cuts.
- Users of the machine which is part of the solution
- Low cost models like sewing machines, blacksmith blower etc, are geography agnostic and can be replicated where the two condition mentioned above are met.
- For DRE solutions which require higher investments, the demand factor/ foot fall/ capacity utilization of the solution should also be considered.
- In case of DRE solutions which require exceptionally high investments like Cold Storage, the selection of geography should asses all aspects of its use in the given geography to arrive at potential capacity utilization per year.

However, the feasibility of DRE model/ solution should also be seen from the viewpoint of applicability, independent of demand and financial feasibility.

Annexure I

Schedule for Respondent: Solution Users (Individual/ Group)
Tool: Semi Structured Interviews based on Checklist
Sample Size: As per defined sample for each Solution (Annexed)

Namaskar. My name is _____. I am from Sesta Development Services, a social sector organization based in Guwahati. We are currently doing a study to understand the potential financing models for scaling up solutions for Selco Foundation. As you are one of the user/ beneficiaries of the solution developed and extended by Selco Foundation, I/ we would like to ask you some questions related to its usage. This information would help Selco Foundation to understand strengths and weaknesses in their solutions and would provide necessary learning for future efforts.

Would you like to participate in the same?
Yes- Questionnaire
No- End.

General

S. No.	Questions	Answers	
1	Name of Enumerator		
2	Date of interview		
3	Name of Solution	Blacksmith Blower Sewing Machine Spinning Machine LSK DC Fridge Food Processing Water Pump Cold Storage Milking Machine Egg Incubator Vaccine Refrigerator	1 2 3 4 5 6 7 8 9 10 11
4	Name of Interviewee/ Telephone Number		
5	Name of Village/ Town, Block, District		

Details on Solution

1. What does the solution comprise of? Is it machine and solar panels?
2. What is the use of the solution?
3. What were you using before this? What were the issues that have been solved by this solution?

4. What is the catchment for this solution / how many people/ households access this solution?
5. Since how many months have you been using this solution?

Business Model

1. What are the major inputs and outputs of the business? What are the backward and forward linkages do you have that directly relates to the solution?
2. What are the various market linkages do you have for the products?
3. What is the financial support do you have for your enterprise?
4. Do you think you have sufficient capacities or you have been trained in the particular skill?
5. Have you accessed or do you have access to schemes to support your enterprise/ solution?
6. Are you being provided handholding support by social organization/ experts?

End User Vulnerability

Is there a income vulnerability/ access to subsidies due to the following?;

Factor	Impact	Applicable
Remoteness	Lack of linkages	
	Limited local markets/lesser population density	
	Lack of access to basic services to the community	
Urban Poor or Slums	High competition in available markets/limited profit realisation	
	Increased Income Sources	
Disability	Increased Income Sources	
	Need for appropriate modification for easy usability	
	Lack of social capital	
Group based infra set up	Lack of regional economic development	
	Lack of access to basic services for the community	
Specifically Vulnerable Communities (Transsexuals, Sex Workers, Widows)	Increased Income Sources	
	Lack of social capital	

End User Typology

1. Who is the end user (Individual/ group)?
2. What are the sources of income/ livelihood for the User?
3. What is a broad annual income for the User?
4. Reason for using the Solution?
5. What are the major risks/ vulnerabilities with respect to use of the technology?
   a. Socio-economic
   b. Geographic
   c. Climatic
   d. Market
6. What is the catchment for the solution? What is the average foot fall for the solution per day? How many days in a year is the solution in demand? What average foot fall per day can the solution handle?
7. What is the average price to the customer per use? What is the average cost of use? What are the components of the cost?

Financial Model

1. Projected model: To be provide by Selco Foundation
2. Current model: To be developed as follows;

S. No.	Capital Expenditure	Amount (in INR)	Remarks
1			# Cost of Solar Panels (No and costs) # Cost of Machines (Provide names of machine with costs)
2			
3			
4			
	Total		
S. No.	**Source of Financing**	**Amount (in INR)**	
1	Self		Direct Investment by the user
2	Subsidy		Amount and source of subsidy
3	Loan		Amount, source and rate of interest
4	Any other		Other sources of financing
S. No.	**Calculation of Revenue***	**Amount (in INR)**	**Remarks**
1			# Should cover seasonal variations.
2			
3			
4			
	Total annual sales		

S. No.	**Calculation of Cost**	**Amount (in INR)**	**Remarks**
1			
2			
3			
4			
	Total annual costs		
A	**Annual Income before deducting loan servicing**		
B	**Annual loan servicing (EMI * 12)**		
C	**Loan Servicing**		
D	**Overall income of the user**		

* Revenue and cost to developed as cash flows, wherever applicable, in the following format

S. No.	Items	J	F	M	A	M	J	J	A	S	O	N	D
	Revenues												
1													
2													
	Total												
	Costs												
1													
2													
	Total												
	Net Income												

Change in Incomes due to the Solution

A basis of calculation needs to be developed for the following changes on an annual basis;

1. Change in cost of inputs
2. Change in labour costs
3. Change in incomes due to change in productivity
4. Change in incomes due to diversification of sources of income
5. Change in costs due to change in larger community savings (Quant/ Qual definition)
6. Change in drudgery (Qualitative definition)

Current Financing/ Loan

1. What was the source of financing utilized?
2. What were the terms and conditions of financing?

3. What were the challenges faced in accessing finance? Was any support provided by the project to access finance? If yes, would the finance been possible without that support?

Other Financing Models

1. What are the other source of financing available in the region?
2. What are their terms and conditions of financing? (Amount, period of finance, collateral, rate of interest etc.
3. What are the challenges faced in accessing finance? Would there be need for any support to be provided by the project to access finance?

Financing Ecosystem

1. Types of Financial Institution availability (no. of FIs in the region, access to the FIs, BC networks, Bank accounts etc)?
2. What is the willingness of the financial institutions to finance? This is impacted by NPAs, Small ticket size of loan accessed or targeted, issue of availability of documents esp. for migrant/ landless labourers?

Subsidies

1. What are the existing/ potential sources of subsidies, conditionalities/ target groups etc?
2. What are the specific cases where subsidies should be provided given cost of accessing energy/ need for the solution etc.

Annexure II
District-wise Sample

		Districts	Kamrup R		Nalbari		Dhubri		Morigaon		Sonitpur		Baksa		Solutions Installed	
S. No.	Vertical	Name of Solution	Solutions Installed	Sample	Solutions Installed	Sample	Solutions Installed	Sample	Solutions Installed	Sample	Solutions Installed	Sample	Solutions Installed	Sample	Total	Sample
1	RMB	Blacksmith Blower	1	1	22	3	1	1			2				27	5
2		Sewing Machine	14	3	4	1	3	1	2		1				40	5
3		Spinning Machine	6	2							11	3			17	5
4		LSK	8	3			2	1	4		4	1			35	5
5		DC Fridge	3	3			4	2							11	5
6		Food Processing			2	2									2	2
7	Agri	Water Pump	13	3	14	2			7				5		39	5
8		Cold Storage			2	2							1	1	3	3
9	AH	Milking Machine			1	1	3	3	3	1					8	5
10		Egg Incubator	9	4	2	1					1				12	5
11		Vaccine Refrigerator			2	2	1	1							3	3
		Total	**54**	**19**	**49**	**14**	**14**	**9**	**16**	**1**	**19**	**4**	**6**	**1**	**197**	**48**