



Financing Decentralized  
Renewable Energy (DRE)  
Based Sustainable Livelihoods





# Table of Contents

## **Preface**

Page 4

## **Background**

Page 5

## **Ecosystem for Enterprises and Energy-Based Livelihood Solutions**

Page 6

## **Typical Profile and Financing Needs of Enterprises**

Page 8

## **Landscape of Financial Institutions**

Page 11

## **Challenges in Financing Energy-Based Livelihood Interventions**

Page 13

## **Mechanisms to Scale Financing for Livelihoods**

Page 15

## **Revolving Fund**

Page 20

## **Case Study ; Livelihoods based DRE Financing (Odisha)**

### **2.1 Credit Linked Schemes-based Financing**

Page 22

### **2.2 Cluster based financing for multiple HHs / Livelihood solution**

Page 34

### **2.3 Group based financing for FPCs / PGs / SHGs**

Page 40

## **Scaling Processes and Way Forward**

Page 44

*The economically disadvantaged, worldwide, including those in Odisha, are perpetually caught in a cycle of managing crises, as they confront one calamity after another. Whether it's the COVID-19 pandemic or environmental catastrophes like droughts or floods, they face the harshest repercussions. Many vulnerable households in Odisha heavily rely on manual labor as their main source of livelihood. However, the services they provide using their physical labor are often expendable, leaving them in a state of perpetual poverty without social safety nets to cushion their fall during times of crisis. Inclusive sustainable livelihoods, built on the expertise of local communities in Odisha, offer a critical pathway to lift the poor out of poverty. For example, livelihood assets such as sewing machines, silk weaving machines, power hammers, integrated rice hullers machines can be instrumental in creating appropriate social safety nets for the underprivileged in Odisha. Moreover, powering these assets with Decentralized Renewable Energy (DRE) solutions like solar can make them a long-term and sustainable option for vulnerable communities in the state.*

*However, establishing the ecosystem required for the poor to own and operate livelihood assets in Odisha poses challenges. This ecosystem needs to include highly efficient appliances, stable market linkages, and affordable financing. One of the biggest challenges is ensuring that poor families can access financing that aligns with their cash flows resulting from sustainable energy-driven interventions. Currently, only a few innovations have occurred in this critical part of the ecosystem in Odisha. Innovations in financing livelihood assets will open a whole new world of DRE-related interventions for the underprivileged in Odisha and globally.*

*The economically disadvantaged populations in Odisha fall into three distinct groups: the poor, the very poor, and those in abject poverty. Cash flows and links to markets differ for each group, necessitating different forms and instruments of financing. The complexity of financial products is as significant as technology innovations, if not more. Financial products range from revolving funds for the very poor segments to reduced interest rates for those with access to slightly more mature ecosystems. It is crucial for these innovations to consider the maturity of livelihood and financial ecosystems in Odisha to avoid subsidizing the wrong link, leading to unsustainable interventions.*

*The document takes a comprehensive look at key financial innovations executed in Odisha, providing concrete examples, case studies, and potential mechanisms for widespread adoption. Various implementations and replications of DRE-focused livelihood interventions in Odisha have further strengthened the hypothesis that they not only enable several families to escape poverty but also integrate them into the formal banking sector. DRE and financing have the potential to uplift vulnerable families in Odisha multiple rungs up the social and financial ladder.*

## Background

Over the last decade, poverty and climate change have posed some of the biggest challenges in the world. Data from 2017 showed that nearly 700 million people in the world were living on less than USD 1.9 a day- a measure of extremely levels of poverty, with a large percentage living in Sub-Saharan Africa or in the developing economies of Asia<sup>1</sup>. As a consequence of the pandemic, the situation looks more dire, with indications that nearly 100 million people may be forced into extreme poverty in 2020 alone<sup>2</sup>.

The challenges of climate change have aggravated existing issues of poverty resulting in increased levels of inequality across geographies. The impacts of COVID-19 will only exacerbate these inequalities. In recent times, majority of the innovations in livelihoods and productivity have focussed on a centralised industrial scale—but the benefits do not trickle down and ownership does not transfer to households living in poverty. Innovations for

people living in poverty have to be decentralised and customised. At the same time, “innovation” should focus less on technology alone, and more on processes around ownership models, financial models, supply chains and service delivery models, which allow for sustained impact. Sustainable Development Goal 7 (SDG7) combined with an ecosystem approach, provides an opportunity to democratise livelihoods- building resilience through improved incomes and opportunities.

**Equipping individual entrepreneurs, farming communities, small and micro enterprises with sustainable solutions for livelihoods (that combine efficient appliances, clean energy systems and efficient building designs with affordable financing models), can contribute to increased productivity and income, reduced expenses (on other energy needs), improved well-being and resilient local economies.**



Looking at **SDG7** and **SDG8** together brings to light much-needed livelihood related opportunities that are common amongst the poor and can be addressed with appropriate energy solutions. Solutions vary across sectors and are customized across geographies for agriculture, animal husbandry, textiles, micro businesses, local crafts and so on.

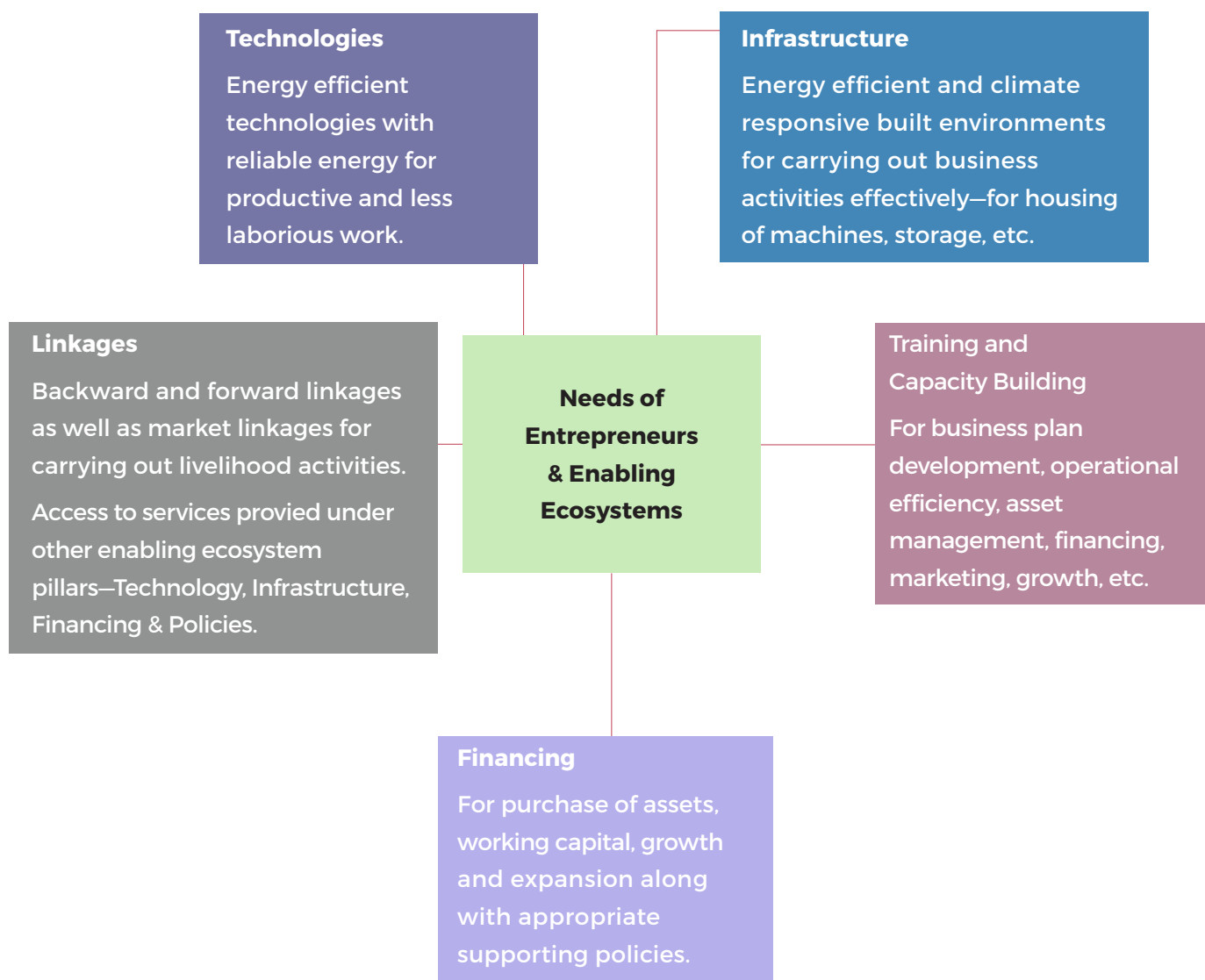
<sup>1</sup> [World Bank – Poverty](#)

<sup>2</sup> [World Bank – Reversal of Fortune](#)

# Ecosystem for Enterprises and Energy-Based Livelihood Solutions

For the purposes of this paper, ‘enterprises’ refer to all such individuals (farmers, entrepreneurs, artisans) and collectives (Self Help Groups, Cooperatives, Federations, Farmer Producer Organizations and so on) involved in one or more livelihood(s). The focus is specifically on such

individuals and collectives that can benefit or are benefiting from energy solutions to reduce drudgery, improve productivity and increase income within their livelihood. The broader needs and the enabling ecosystem for such enterprises is outlined in the figure below.



In the specific context of SDG7-driven livelihood interventions, the ecosystem access for livelihoods includes technology innovation, training and capacity building, appropriate and affordable financing, conducive policy and regulation and

linkages to markets and raw materials.

The key interventions required and the stakeholders involved for each component of the ecosystem are outlined below:

	<b>Stakeholders</b>	<b>Key Support Areas</b>
	<ul style="list-style-type: none"> <li>■ Nationalized Banks</li> <li>■ Credit Cooperative Societies and Cooperative Banks</li> <li>■ Rural Regional Banks</li> <li>■ Micro-Finance Institutes</li> </ul>	<ul style="list-style-type: none"> <li>■ Financial Institute (FI) training and awareness programs</li> <li>■ Target setting with Financial Institutes (Circulars/ MOUs)</li> <li>■ Developing loan products with FIs</li> <li>■ Financial Innovation for unlocking loans (Risk fund/ guarantees Interest subvention for vulnerable livelihoods)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Vendors or Suppliers for efficient need based technologies</li> <li>■ Last mile delivery enterprises or system integrators</li> <li>■ Grassroot research and development labs focused on efficient livelihood solutions</li> </ul>	<ul style="list-style-type: none"> <li>■ Research and development capital, capacity building</li> <li>■ Purchase agreements with vendors and suppliers to meet minimum orders stipulated by vendors</li> <li>■ Working and expansion capital for technology/product vendors or dealers and last mile sustainable energy enterprises</li> <li>■ Incubation and training of sustainable energy enterprises/ system integrators</li> </ul>
	<ul style="list-style-type: none"> <li>■ Industrial Training Institutes</li> <li>■ Vocational Training Schools</li> <li>■ Agriculture Training Centers</li> <li>■ NGOs for Skill Building</li> <li>■ Microbusiness/Grassroot Incubators</li> </ul>	<ul style="list-style-type: none"> <li>■ Demonstration facilities for efficient productive appliances</li> <li>■ Training modules on technology usage, business planning, access to finance, product diversification and marketing</li> <li>■ Trained personnel mentoring and supervising knowledge transfer</li> </ul>
	<ul style="list-style-type: none"> <li>■ Vendors/ Suppliers/Enterprises/ Institutes/</li> <li>■ End Users providing input and output channels</li> <li>■ Producer Companies</li> <li>■ Aggregators</li> <li>■ E-commerce platforms</li> </ul>	<ul style="list-style-type: none"> <li>■ Providing access to relevant networks and connections with stakeholders.</li> <li>■ Exposure visits, expert mentorships, workshops</li> </ul>
	<ul style="list-style-type: none"> <li>■ State and National Level Government Bodies</li> <li>■ Apex banks</li> <li>■ Rural and tribal ministries</li> <li>■ Councils and Departments</li> </ul>	<ul style="list-style-type: none"> <li>■ Broadening scope of skill development beyond wage employment to cover innovation and entrepreneurship/ enterprise</li> <li>■ Incentives and targets for micro and small grassroot businesses to adopt energy efficient and sustainable-energy driven solutions.</li> <li>■ Tax policies designed to encourage sustainable value chains</li> </ul>

Source: Report [https://selcofoundation.org/wp-content/uploads/2021/05/SELCO-Foundation\\_-65-livelihoods-solutions-from-ground.pdf](https://selcofoundation.org/wp-content/uploads/2021/05/SELCO-Foundation_-65-livelihoods-solutions-from-ground.pdf)  
 SELCO Foundation, 2019

# Typical Profile and Financing Needs of Enterprises

At a micro-level, a holistic energy solution for livelihoods comprises (1) Technology and infrastructure, (2) Financing and business models and, (3) Ownership and social models, as depicted in the figure below.




Financing, in particular, is integral to the creation of assets on the ground and building social security. In the context of energy solutions for livelihoods, it plays an important role in replication and scale. In order for more individual entrepreneurs, SHGs and FPOs to access SDG7-driven livelihood solutions, key financing stakeholders such as DFIs, Apex financial institutions, local banks as well as government bodies need to allocate funds, extend loans and develop appropriate financial products.

**Based on learnings over the last 5 years, having implemented more than 100+ sustainable energy driven livelihood interventions, with more 6000 entrepreneurs and enterprises, the solutions have been broadly categorized into micro, small, medium and large with an indication of the typical end-user segments, financial institutions and credit terms that apply for each.**

The typical ticket size, end-user segmentation, financial institutions involved and ideal financing terms for each of these categories is captured in the figure below.



Livelihood Solution Types	Micro	Small	Medium	Large
 <p><b>AGRICULTURE</b> (+ Food Processing)</p>	Hydroponics	Roti Rolling Machines	Integrated Rice Hullers  Millet Processing Units; Flour & Spice Processing	Cold Storage Solutions  Agro-Processing Units
 <p><b>ANIMAL HUSBANDRY</b></p>	Poultry-Lighting	Dairy-Milking Machines	Vaccine Refrigerators; Poultry-Egg Incubators	
 <p><b>TEXTILES &amp; HANDICRAFTS</b></p>	Sewing Machines, Spinning and Reeling Machines, Blacksmith Blower Machines	Pottery Wheel	Green Looms; Integrated Pottery Solution—Blunger, Pugmill, Wheel, Kiln, Built Environment	
 <p><b>Range of Ticket Sizes</b> Energy + Equipment</p>	Upto ₹ 50,000 (\$675)	> ₹ 50,000 – ₹ 1.5 Lakh (\$675–\$2025)	> ₹ 1.5 Lakh – ₹ 8 Lakh (\$1350–\$10,800)	> ₹ 8 Lakh (\$10,800)
 <p><b>System Size Range</b> Approximate</p>	Panels 40Wp to 60Wp Power 15W to 80W	Panels 75Wp to 300Wp Power 65W to 180W	Panels 1kWp to 2.5kWp Power 150W to 2hp	Panels Agro Processing >3kWp Agro Cold Storage 7kWp to 14kWp
<p><b>Typical End-User Types</b> Individual, SGH, FPO</p>	Individual	Individual	Individual; SGH; FPO; Cooperative	SGH; FPO; Cooperative
<p><b>Typical Combination of Financing Institutions</b></p>	Local Saving Credit Chanel, MFIs, NBFCs	MFIs, NBFCs, RRBs, Nationalized Banks	RRBs, Nationalized banks, Government scheme	Government scheme (part loan through RRB/ Nationalized banks)

Across all of these categories, there are certain basic financing needs that enterprises have, including access to sustainable energy solutions. A broad outline of the typical financing needs are given below.



## Typical Financing Needs of SDG7 Driven Livelihoods

### CAPEX

#### *Initial*

Purchase of the clean energy system (in case of a loan, this would include margin money/ deposit for loan).

Purchase of efficient appliances / equipment.

Start-up capital or working capital for the livelihood entrepreneur.

### CAPEX

#### *In Medium-Long Term*

Replacement of batteries or specific components post the warranty period (within the lifetime of the larger asset).

Upgrading energy system (loan for additional generation capacity).

Working Capital for additional expansion and diversification.

### OPEX

Maintenance or service fee (annually 1-2% of system cost).

(In case of a loan), monthly payments or installments towards the energy system.

Raw materials, rent, labour, overheads etc. to run the business/ enterprise.

Source: Analysis of SELCO Foundation interventions; Based on available research on financing for DRE solutions ,

# Landscape of Financial Institutions

There is a large network of Financial Institutions (FIs) that could be used to unlock financing and meet the needs discussed above. They range from formal banks including Nationalized banks, Regional Rural Banks and Cooperative banks to Non-Banking Financial Corporations (NBFCs) and Micro Finance Institutions (MFIs), and to local and more informal financial linkage channels such as Self-Help Groups (SHGs), Community based organizations (CBOs),

cooperative societies and so on. SELCO Foundation works across the spectrum with many of these institutions to unlock credit for enterprises to access energy-based livelihood solutions.

The figure below captures the key characteristics of these categories of FIs including typical loan profiles, geographical coverage, interest rates and risk appetite.

## Typology of Banks / Financial Institution

Banks			Other Financial Institutions	
Public Banks				
Private Bank	SBI & Other Nationalized Bank	Regional Rural Banks	Cooperatives	NBFC-MFI
<b>Loan Profile</b> Varied (40% to priority sector)	<b>Loan Profile</b> Varied (40% to priority sector)	<b>Loan Profile</b> Aimed Towards Agri and SME, Small Personal Loans (75% to priority sector)	<b>Loan Profile</b> Loan Profiles Change with the Type of Cooperative (Housing, Agri, Non-Agri Credit, etc.)	<b>Loan Profile</b> Small Loans with Multi-Utility
<b>Ownership</b> Private Equity	<b>Ownership</b> Govt. Owned (Central Govt. take over of Private Banks)	<b>Ownership</b> Govt. Owned (Central and State along with a Sponsor Bank)	<b>Ownership</b> Owned by Groups of Individuals via Shareholding and are Grouped by Community, Geography or Type of Occupation	<b>Ownership</b> Private Owned
<b>Geographical Coverage</b> Pan Nation	<b>Geographical Coverage</b> Pan Nation	<b>Geographical Coverage</b> Limited to Certain Number of Districts in a State	<b>Geographical Coverage</b> Limited in Scope, Defined by an Individual Co-operative	<b>Geographical Coverage</b> Defined by the MFI
<b>Interest Rates</b> Higher than Nationalized Banks	<b>Interest Rates</b> Same or Lower than Private Banks	<b>Interest Rates</b> Lower or Similar to Nationalized Banks	<b>Interest Rates</b> Higher than Public and Private Banks, Lower than Informal Lending Agencies	<b>Interest Rates</b> Higher than Public and Private Banks, Lower than Informal Lending Agencies
<b>Risk Appetite</b> Low to Medium	<b>Risk Appetite</b> Low to Medium	<b>Risk Appetite</b> Medium to High	<b>Risk Appetite</b> Medium to High	<b>Risk Appetite</b> High
<b>USP</b> Relatively Quicker Loan Sanctioning Process	<b>USP</b> Higher Coverage	<b>USP</b> Mandated to Rural Development & Priority Sectors	<b>USP</b> Relaxed Lending Process or Policies	<b>USP</b> Doorstep / Grassroot Lending

In addition to the ones outlined above, Small Finance Banks also play an important role at the last mile with conditions similar to MFIs.

Another important piece in the financing landscape is the local savings-credit channels such as Joint Liability Groups (JLGs), Self Help Groups (SHGs), and Cooperative societies, that

act as a channel between banks and end users, and as a conduit for government subsidies.

Through the work on energy-livelihood solutions with enterprises on the ground, there are insights about the pros and cons of each of these institutions/ financing channels.

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**The choice of which financial institution and what terms would make sense for a particular enterprise is dependent on a combination of factors including the geography (remoteness, terrain), socio-economic conditions (low income vis-a-vis extremely vulnerable communities), business prospects (existing demand and market linkages), presence and penetration of financial institutions and so on.**

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On the one hand, institutions with a local presence such as MFIs, NBFCs and NGOs possess an in-depth understanding of the under-served communities they work with, and some provide complementary livelihood promotion services such as capacity building and market linkage support. However, providing doorstep finance to last mile communities comes at a higher cost. With high transaction costs and limited access to low cost capital, enterprises borrowing from these institutions for energy-based livelihood solutions will have to take on some or all of the burden of higher credit cost. The transaction costs also make it un-viable to provide longer term loans and the time frame is restricted to 12-18 months.

For less vulnerable segments among the poor, loans for smaller capacity solutions such as solar powered sewing machines, roti rolling machines, blacksmith blowers, basic digital service centers can be financed. But accessing loans for larger capacity solutions such as flour, rice and spice processing, green looms, integrated pottery solutions etc. with longer repayment periods is much harder.

On the other hand, Regional Rural Banks (RRBs) that have the mandate to provide affordable financing for a longer time frame (3-5 years)

and at interest rates of between 10-15% are more reluctant to lend for smaller ticket sizes. The collection and transaction costs make it financially un-viable unless there are enough enterprises requiring such small ticket size loans from a certain area where a Business correspondent (with commission from the bank) can manage documentation and collection.

While the landscape above features institutions mainly providing debt, **there is also a critical grant component, from government budgets and schemes, that needs to be unlocked.** These are currently managed and allocated by different departments, targeted at vulnerable communities (Women and Child Welfare Department, Ministry of Tribal Affairs, and so on) or specific sectors (Ministry of Food Processing Industries, Ministry of Agriculture, Department of Animal Husbandry, Ministry of Textiles).

These can be leveraged to fund SDG7 driven solutions for livelihoods that can increase productivity and income within a specific sector while also empowering vulnerable segments to improve wellbeing more broadly.

<sup>3</sup> [Green Inclusive Energy—Financing Decentralized Renewable Energy](#)

# Challenges in Financing Energy-Based Livelihood Interventions

From an **enterprise perspective**, some of the key challenges to accessing credit include:

## **Absence of Financial Institutions in Remote Areas**

The level of bank and financial institution penetration varies significantly across the country. In more remote parts, such as the hilly regions of North East India and the tribal and forested areas of Eastern and Central India, the low density of population combined with the difficult geographical terrain make it much harder for banks to set up branches, provide doorstep access to credit and facilitate collections.

## **Limited Awareness and Readiness to Prepare Business Plans**

Enterprises have limited awareness about what financial products and government or bank-run schemes exist and more importantly, how these can be applied to access energy solutions for livelihood.

Depending on geography and their socio-economic background, they may lack the flexibility and capacity to follow up and convince banks or financial institutions. Submitting business plans and documentation to access loans would require access to local accountants and project developers to compile financial details about their enterprise and the solar solutions. Many of these enterprises have insufficient credit history and lack adequate collateral or savings, which affects their loan prospects.

## **Affordability**

Where there is access to financial institutions and the knowledge about traditional financial products, a significant barrier is the cost of capital. For example, the upfront deposit or margin money down-payment (between 10-20% of the loan amount), is often too high for some enterprises to afford since livelihoods are dependent on future cash flows.

Another challenge is around unlocking sources

of working capital for someone starting-up a new livelihood. The loan provided is often solely for the asset and does not consider the start up capital required.

## **Lack of Long-Term Asset Based Financing**

Much of the credit available for poorer communities is for smaller ticket sizes, with shorter tenures of 1-2 years and higher interest rates. While these are important in financing smaller energy capacity solutions such as solar powered sewing machines, blacksmith blowers, and digital service centers, they are largely unsuitable for larger capacity energy solutions in agriculture, processing, animal husbandry, textiles and so on.

The credit from MFIs is typically available for a 1-3 year period while in the case of banks, the tenure is a maximum of 5 years for such energy loans. But with the need for more processing equipment and larger assets like cold storage, there is a critical gap in the availability of longer term infrastructure financing at 5-8% interest rates and 7-15 years tenures.

**This restricts the options available to livelihood entrepreneurs and groups like FPOs and SHGs interested in energy solutions. Most significantly, it adversely affects the prospects of the most vulnerable to access any kind of affordable credit for asset-based solutions.**

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There are also challenges from a financial institution perspective that cause reluctance and unwillingness to finance energy-based livelihood solutions. These include:

### **Lack of Awareness About Solutions and Incentives to Take Risk**

This is primarily on account of a lack of awareness about the types and viability of energy based livelihood solutions. In the absence of circulars from apex financial institutions or head-offices, targets or incentives, the local branch is unsure of the applicability of schemes for such loans and the terms under which credit needs to be provided.



### **Perceived Risk and Lack of Confidence About Business Models**

The perceived risk is also higher owing to the newness of technology and approach (appliance efficiency, clean energy system, efficient built environment design). Without adequate evidence (within a specific geography) and understanding of the business model, payback periods and the capital support or leverage needed to make the solution work in the near

term, it becomes time consuming to convince banks and other financial institutions to lend for energy-livelihood solutions. Other factors such as the transfer of champion branch managers, or negative preconceived notions about regions or communities as a collective also affect the prospects of having a loan sanctioned.

### **Transaction Costs**

Transaction costs involved in facilitating financial linkages, particularly for last mile communities in remote regions can be extremely prohibitive. The activities include formation of SHGs, identification and training of business correspondents, undertaking financial literacy with new end-users, as well as aspects of customer documentation and recovery of credit.

These challenges are exacerbated in more difficult terrains and with more vulnerable populations, that are also most in need of credit and support to access SDG7 driven livelihood solutions.



# Mechanisms to Scale Financing for Livelihoods

In order to address the challenges discussed in the previous section and facilitate financial linkages for energy-based livelihood assets, SELCO Foundation has worked with NGO partners and FIs to utilize a set of key instruments, customized to specific needs and contexts. While some of these are in use within programmes/ products of FIs and government

agencies, there is much more potential to use them and catalyse financing for energy-livelihood interventions. The main challenges they address, their characteristics and value add in the context of SDG7 and whether they are supply side or demand side support instruments are outlined in the table below<sup>4</sup>.

Instruments	Financing Challenges Addressed	Characteristics and Value Add <i>In the context of SDG7</i>
<p><b>REVOLVING FUNDS</b> <i>Supply Side Support</i></p>	<p><b>Absence of FI in the local area</b></p> <p><b>Perceived risk and reluctance to lend to ‘first time’ customers, particularly in poorer, more remote regions</b></p> <p><b>Lack of long term financing and limited credit availability in local community (informal) savings-credit channels</b></p>	<ul style="list-style-type: none"> <li>■ Infusion of capital for on-lending to enterprises/ end users</li> <li>■ Repayments help replenish the corpus and loans can be extended to an additional number of enterprises/ end users</li> <li>■ Operational budget for fund managing entity- local CBO, NGO, MFI- may be covered through a percentage of the interest rate on each loan</li> </ul> <p><b>Value add:</b></p> <ul style="list-style-type: none"> <li>■ Help enterprise/ end user develop a credit history and become ‘bankable’ in the medium term; first step towards establishing linkages with formal FIs</li> <li>■ Create a portfolio for energy solutions within the local MFI, NGO that can ensure collections and prove modalities about financing to certain communities</li> </ul>
<p><b>INTEREST SUBSIDIES; MARGIN MONEY SUPPORT</b> <i>Demand Side Support</i></p>	<p><b>Affordability for the entrepreneur; ability to purchase more expensive energy-based assets for livelihoods</b></p>	<ul style="list-style-type: none"> <li>■ Loans for energy-livelihood solutions are more accessible and affordable with lower interest rates, waivers on margin money down-payments and longer repayment periods.</li> <li>■ Exact amount of subsidy support can be determined based on ticket size, level of vulnerability and expected monthly cash flow of enterprise etc.</li> </ul> <p><b>Value add:</b></p> <ul style="list-style-type: none"> <li>■ Establish financial linkage and unlock capital for livelihood entrepreneurs, while considering affordability</li> </ul>

**RISK****GUARANTEES***Supply Side Support*

**Lack of awareness and incentives for FIs to take risks**

Perceived risk and reluctance of banks and low levels of confidence to lend to specific communities; or lend larger amounts to individual entrepreneurs

Guarantees are essentially collateral (administered as fixed deposits) to be utilized by banks and FIs in the case of a default on loan repayments

Amount/ percentage of collateral required against a loan for a certain community is dependent on geographical context, socio-economic background and the Bank/FI's risk perception

**Value add:**

Reduce risk and allay concerns of financial institutions

Help entrepreneur/ end user develop a credit history and access additional loans for other livelihood needs

**CAPITAL****SUBSIDIES***Demand Side Support*

**Affordability for the end user:**

Solutions may be expensive because supply is still low compared to the need

Vulnerable communities are in need of solutions for better income generation prospects

**Perceived risk and reluctance of banks to lend for solutions that are:**

Large ticket size

Relatively low implementation numbers

New to a geography

Subsidies cover the gap between cost of the solution (appliance + clean energy system) and end-user affordability

Exact subsidy amount is calculated based on a combination of:

- Socio-economic condition and vulnerability of individual entrepreneur;
- Current energy expenses
- Their potential for income generation using the solution (business plan and post-intervention cash flow)
- Cost of capital and terms of the loan
- External factors such as market linkages

**Value add:**

Ensure that enterprise and community do not pay the cost of inefficiencies within the ecosystem

Reward them, instead, for being early adopters

Democratize energy provision and enable benefits for the community (through improved access to services and savings)

Send out the right signals to manufacturers of efficient appliances or improved battery technology (through increased implementation) about the market demand for such innovations

Allow FIs to part finance interventions that can become part of their regular lending portfolio in the future



**SUBSIDIES FOR TRANSACTION & ADMINISTRATIVE COSTS***Supply Side Support*

**Affordability** for end users that are in fringe areas and difficult terrains

**High transaction costs** to FIs to facilitate financial linkages, and cost to energy enterprises, NGOs to install systems and ensure collections in these remote geographies

Subsidies to cover the costs of reaching out to remote communities:

- Transportation Costs—for energy enterprises to install and service these solutions
- Administrative Costs—for FIs to undertake financial linkage activities including SHG formation, financial literacy, training etc.
- Transaction Costs—for local NGOs/ FIs/ energy enterprises to manage regular collections and repayment

**Value add:**

Adequate interest from FIs, NGOs and Energy Enterprises to work in remote geographies where solutions would otherwise be inaccessible or be extremely expensive to the end-user


Source: Analysis of SELCO Foundation interventions (2015-2020); Building on research available on financing DRE<sup>5</sup>



Based on the solutions implemented so far across varying socio-economic demographics, the table below maps the kind of financing that is both affordable and feasible for each type of livelihood solution, and accordingly suggests the kind of support or instruments needed.

<sup>4</sup> Adapted from IIED, Supply side support provides benefits to FIs/ facilitators/ businesses by reducing their costs or risks (examples include: Tax exemptions, concessional debt facilities for energy providers, risk-sharing instruments, RBF, guarantees, transaction costs support etc. Demand side support provides benefits to the end-user by reducing prices. (Examples include cash transfers, interest subsidies for end-user loans, vouchers, capital subsidies).

<sup>5</sup> Green & Inclusive Energy— [Financing Decentralized Renewable Energy for the Last Mile](#) - What funding sources and instruments can be applied?

Types of Livelihood Solutions	Micro	Small	Medium	Large
 <p><b>Range of Ticket Sizes</b> Energy + Equipment</p>	Upto ₹ 50,000 (\$675)	> ₹ 50,000 – ₹ 1.5 Lakh (\$675–\$2025)	> ₹ 1.5 Lakh – ₹ 8 Lakh (\$1350–\$10,800)	> ₹ 8 Lakh (\$10,800)
<b>Typical Combination of Financing Institutions</b>	Local savings-credit channels, MFIs, NBFCs	MFIs, NBFCs, RRBs, Nationalized Banks	RRBs, Nationalized Banks, Government Scheme	Government Scheme <i>Part loan through RRB/ Nationalized banks</i>
<b>Affordability of SDG7-Driven Livelihood Solutions in Terms of Credit</b>				

### Poor

Energy Scenario:  
Unreliably Electrified

Socio-Economic Status:  
Energy and income poverty but with some access to resources and capital.

ROI			
18–22%	10–15%	5–10%	4–5%
Tenure			
1–1.5 Years	2–3 Years	3–5 Years	7–10 Years
<b>Instruments:</b> Margin Money Subsidy Risk Guarantees	<b>Instruments:</b> Margin Money Subsidy Interest Subsidy Risk Guarantees	<b>Ideal Instruments:</b> Capital Subsidy + Interest Subsidy on Part Bank Loan	<b>Ideal Instruments:</b> Capital Subsidy + Interest Subsidy on Part Bank Loan

### Extreme Poverty

Energy Scenario:  
Completely Off-Grid

Socio-Economic Status:  
Vulnerable

Climatic & Regional:  
Forested, Hilly Regions, Disaster Prone

Socio-Economic:  
Persons With Disabilities (PWD), Tribal communities, Single mothers

ROI			
10–15%	5–10%	3–8%	<b>Asset Fully subsidized</b>
Tenure			
2–3 Years	3–5 Years	3–5 Years	
<b>Instruments:</b> Margin Money Subsidy Interest Subsidy Risk Guarantees Separate Revolving Fund	<b>Instruments:</b> Margin Money Subsidy Interest Subsidy Risk Guarantees	<b>Ideal Instruments:</b> Capital Subsidy + Interest Subsidy on Part Bank Loan Higher Value Asset + Capital Subsidy will Mean Risk Guarantee is Not Needed	<b>Ideal Instruments:</b> Capital Subsidy on Complete System (grant funding for asset creation) Opex Alone Covered by Enterprise

Source: Compiled based on SELCO Foundation implementation and learnings across livelihood solutions and geographies (since 2015).

Working with partners and FIs across geographies (primarily in South, Eastern and North Eastern India), SELCO Foundation has identified bank-level, sectoral and welfare schemes -some of which have been unlocked—

to finance sustainable energy-powered livelihood solutions. The table below captures a subset of these schemes and the types of support provided through them.

Name of the Scheme	Nodal Agency Category	Interest Subsidy	Margin Money Support	Guarantee / Collateral Free	Capital Subsidy	Notes	Type of Solar Powered Livelihood Solutions Financed
<b>Bank-Level</b>							
Differential Rate of Interest (DRI)	RBI; Banks					For loans of max. of INR. 15,000 @4% ROI	Sewing machines, LSKs, Blacksmith Blower Machine
Mudra Loans	MSME Ministry; SIDBI					3 categories for loans ranging from INR. 50,000 to INR. 10 Lakhs @10% ROI (approx)	Sewing machines, LSKs, Roti Rolling Machine, Blacksmith Blower Machine
PMEGP Loans	KVIC- MSME						Pottery Wheels
CCTMSE	MSME Ministry; SIDBI;						—
<b>Sectoral</b>							
Dairy Entrepreneurship Development Scheme	Ministry of Animal Husbandry; NABARD						Milking Machine
Traditional Artisans Development Scheme	DIC, State Government						Pottery Solutions- Wheel, Blunger, Pugmill
NABKISAN Credit	DIC, State Government					ROI: 9.35% to FPOs	
National Rural Livelihood Mission	DIC, State Government					Interest subsidy for loans upto INR. 3 lakhs to women SHGs	
<b>Welfare-Oriented</b>							
Odisha Livelihoods Mission (OLM) Integrated Tribal Development Agency							Flour Processing—with Destoner, Grader and Milling Unit
Eco Development Committee Fund	District Forest Officer (Forest Department)						Solar Powered Sewing Machines (livelihood center)
Udyogini	Women and Child Welfare Department						
Scheme for Persons with Disabilities (PWDs)	14th Finance Commission					100% Grant for Individuals with Disabilities	Roti Rolling, Sewing, LSK

## Revolving Fund

As discussed in the table above, revolving funds can be set up to enable financing through local channels including smaller MFIs, local NGOs and community institutions such as cooperatives and federations. This instrument is simply a first step in proving credit worthiness and helping determine the modalities for financing solutions within a specific community. The next step would ideally be a linkage with formal FI and interest subsidies or margin money support to make the solution affordable for the enterprise.

**The fund is administered through a separate bank account, where the repayments or collections can be deposited. New loans are then sanctioned based on the repayments coming into the corpus. It works best for loan amounts which can be repaid within a 1-2 year period (for example micro and small livelihoods. This ensures that there is adequate money in the corpus to 'revolve' and cover the costs of managing the fund (administrative fees etc.). Once the fund becomes too large, the transaction costs increase and make it unviable, warranting a move to more formal financial linkage.**

Capacity building of key intermediaries and institutions involved in actually disbursing the loans- local MFIs or community based institutions- is extremely important, particularly where the solutions being financed may be unfamiliar or new, like with solar powered livelihoods. There is also an important element of economic literacy

for livelihood activities (going beyond basic bookkeeping and accounting) so local livelihoods and enterprises are clear about how the energy intervention affects their business model, cash flow and financial management.



## Case Study ; Livelihoods based DRE Financing

The case studies below illustrate the various aspects that need to be considered to enable financing for energy solutions. The energy loans have been disbursed under existing schemes like MUDRA, PMEGP etc. and other financing options. Hence, the case studies are categorized into 3 categories of Credit linked scheme, Cluster based financing and Group based financing.



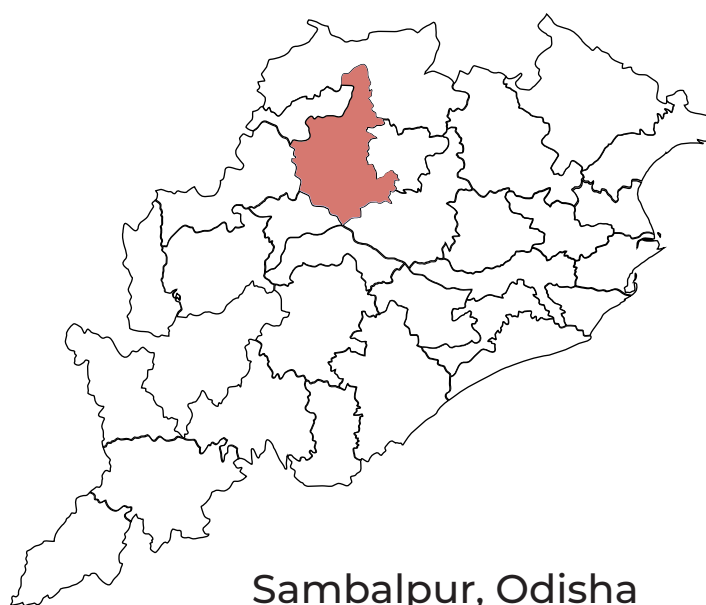
## 2.1 Credit Linked Schemes-Based Financing

### MUDRA Scheme Case Study

#### Potter Entrepreneur, Sambalpur

Mr. Kshireswar Rana

01



Sambalpur, Odisha

*“Installation of solar powered pottery wheels has helped me immensely. I can do twice the amount of work, and my income has doubled as well. Earlier I had to say no to customers, especially during peak season. With this enhanced income, I am also able to contribute to the house and education of my children”*

*- Mr. Kshireswar Rana*



### Background

Kshireswar Rana, 39 years old, is a progressive potter who resides in Kumbharpada village, Gadamura G.P of Dhankauda block, Sambalpur. He has studied up to the 9th class and lives with his parents, wife, and two sons. Pottery is his primary occupation and he has been in this business, for the last 20 years. His family also supports him in this work, Besides, They are also engaged in paddy farming for at least 2 months from July to September, Kshireswar received terracotta training from the Department of Handicrafts, Government of Odisha at his village along with 15 other villagers. Odisha Rural Development & Marketing Society (ORMAS) has supported in forming a Producer Group (PG) and marketing their finished products.



## Problem Statement

Kshireswar Rana was running his business using traditional methods, such as traditional wood wheels, and manually kneading mud or materials to prepare them. He used firewood and the traditional method for firing the products. He performed all the processes manually, which involved significant drudgery. Due to manual labour, time-consuming processes, and erratic power supply for about 3-4 hours a day, he was not able to complete orders on time and had to work continuously, involving his family as well. Hence, he planned to set up a solar-powered pottery wheel and took the initiative to leverage loans from financial institutions.



## Solution

SELCO Foundation supported him with a solution of a solar-powered pottery wheel with a more efficient 360-watt Permanent Magnet Direct Current (PMDC) motor and facilitated a loan from UCO BANK under the MUDRA scheme.

He voluntarily approached SELCO Foundation through one of its champions from the same village and got involved in the entire loan process.



## Impact

Presently, his revenue/income has increased to Rs.900-Rs.1000 per day, electricity bill has also come down by Rs.300-400 a month. He had no problem paying the EMIs. While the loan was for 5 years, the recovery of the project was estimated to be done within one year. The solution has been a good model for Government, Non-government stakeholders and financial institutions as the end user could leverage more than 70 percent of the amount from the bank.

Financial Details	Technical Details
Total cost of the project: Rs. 94,720	Solar module: 330Wp 24V , No - 1
Bank loan through UCO Bank : Rs. 58,000 (For solar system)	Solar battery: 100Ah 12V, No - 2
Gap finance support for purchasing pottery wheel by SELCO Foundation: Rs 21,500	Pottery wheel: 350 watt PMDC motor
End user contribution: Rs.15,000	Charge controller
Interest rate: 8.9%	
Tenure : 5 years	

# MUDRA Scheme Case Study

## Sewing Machine Entrepreneur, Kalahandi

Mr. Ramsingh Kabadi

02



Kalahandi, Odisha

*“Since, I am responsible for my families’ well being, so solarizing the sewing machine has helped me immensely. My productivity and income has increased. Moreover, accessing MUDRA loan was a great achievement for me and now I am aware of it and also can make others understand the process to avail it”*

*- Mr. Ramsingh Kabadi*



### Background

Ramsingh Kabadi, a 35-year-old micro-entrepreneur from Badchatrang village, Thamal Rampur block of Kalahandi district, Odisha. His primary occupation is tailoring work, and he has been in this business for the last 13 to 14 years. He was in a very poor socio-economic condition, with an annual income of less than Rs. 70,000. His family also supports him in his work. Besides, they are also engaged in seasonal farming of paddy. Ramsingh has received training in tailoring work. He is an exemplary entrepreneur who has been obtaining finance from banks to utilize solar energy and create a sustainable livelihood for himself.





## Problem Statement

Ramsingh was using a manual sewing machine, which involved significant drudgery and was time-consuming. He was earning between Rs. 6,000 and Rs. 7,000 per month. As a result, he was unable to keep up with his orders, especially during the wedding and festival seasons. Despite having electricity at home, he did not want to switch to a motorized sewing machine due to the unreliable and poor grid supply. Instead, he desired to install a solar system for his sewing machine.



## Solution

Ramsingh required financial assistance to acquire the solar solution and motorized machine. SELCO Foundation, in partnership with Canara Bank, facilitated a loan under the MUDRA scheme. After two years, he approached the same bank and obtained an additional loan of Rs. 20,000 under the MUDRA scheme to expand his business. Following the COVID-19 pandemic, he recognized the potential of the Rice Huller and Paper Plate unit in his area. He acquired a loan of Rs. 1 Lakh to initiate the units and diversify his business.



## Impact

Today, Ramsingh is able to meet the seasonal demands and keep up with the orders, resulting in higher income. Increasing his productivity by 1.5 times per hour, Ramsingh has experienced an immediate increase of Rs. 2,500 per month. His earnings have also increased during the festival season. Furthermore, a solar light in his shop enables him to work late in the evenings, providing him with the flexibility to handle a large number of orders. Within two years, Ramsingh fully paid off and closed his loan. After one year of his initial loan, he approached the bank for a second loan to construct and expand his tailoring shop, purchase another machine, and solar power it, allowing his brother to join him as well.

Financial Details	Technical Details
Total cost of the project: Rs. 24,185	Solar Module: 100Wp, No - 1
Bank loan through Syndicate Bank ( As now Canara Bank) : Rs.19,185	Solar Battery: 60Ah, No - 1
Gap finance support by SELCO Foundation : Rs. 5000	PMDC Motor: 60W
Interest rate: 9.68%	Sewing machine
Tenure: 28 months	

# MUDRA Scheme Case Study

## Kiosk Center Entrepreneur, Kalahandi

Mr. Subas Chandra Disari

# 03



Kalahandi, Odisha

*“In this area there is a power issue for at least 3-4 hrs in a day and people could not get the services. But now, due to solar solutions these services can be provided easily. And I am also contented as I received MUDRA loan for expanding my business”*

*-Mr. Subas Chandra Disari*



## Background

Subas Chandra Disari, an entrepreneur from Hirapur village in the Jayapatna block of Kalahandi district, is a 10th-grade graduate facing significant socio-economic challenges. His annual income was less than Rs. 30,000. He belongs to one of the most remote areas of the block, predominantly inhabited by tribal communities who have long faced socio-economic challenges. In such a region, the effects of the Covid lockdown dealt a severe blow to many micro-entrepreneurs, including Subhas and his family. However, Subas found ways to cope with the ongoing crisis through sustainable solutions.



## Problem Statement

The Kalahandi district has several villages with no basic energy access. Hirapur village also faces regular power cuts. Due to the lack of infrastructure in the remote area, there is limited access to basic digital services such as photocopying and printing. Without these services, villagers had to travel approximately 70-80 kilometers to obtain basic documentation required for accessing government schemes and banking services.



## Solution

SELCO Foundation supported Subas to set up a solar-powered kiosk center or digital service center. To finance the center, Subas received support from State Bank of India through a loan under the MUDRA scheme, which provides a credit guarantee for collateral-free loans at a lower interest rate. His center has a photocopier machine, laptop, and printer. The center primarily serves the local community, offering a range of services such as printing, photocopying, photography, and lamination.



## Impact

As banking is considered an essential service, the kiosk was permitted to remain open during the lockdown, enabling Subas Disari to sustain certain aspects of his business. While the lockdown has affected income from a variety of services, the banking kiosk continued to bring in money. Individuals have visited the kiosk to withdraw money from their accounts and receive monthly subsidies and stipends from various government schemes, such as LPG subsidies and Jan Dhan Yojana, among others. This is the only kiosk of this sort in the local village panchayat jurisdiction. Subas generates a monthly revenue ranging from Rs.10,000 to Rs.15,000, resulting in an income of Rs. 8,000 to Rs.10,000 per month. Thanks to a reliable and consistent power supply, Subas can work productively throughout the day and even during the night.

Financial Details	Technical Details
Total cost of the project: Rs. 83,947	Solar module: 75Wp. No - 3
Bank loan through State Bank of India : Rs. 60,000	Solar battery: 150Ah, No - 2
Gap finance support by SELCO Foundation : Rs. 20,000 (Margin Money)	Inverter: 850VA
End user contribution: Rs. 3,947	Laptop, Printer
Interest rate: 9.68%	
Tenure: 60 months	

# MUDRA Scheme Case Study

## Lok Seva Kendra Entrepreneur, Kalahandi

Mr. Haru Majhi

04



*“Earlier, due to power failure, people from nearby areas had to wait and go back without availing services, but now I am able to provide uninterrupted services”*

*-Mr. Haru Majhi*



### Background

Haru Majhi, an entrepreneur from Dumerpada village in Thaumal Rampur block of Kalahandi district, comes from a family with modest incomes and belongs to the Kondha tribe, an ethnic scheduled tribe of Odisha. His annual income was less than Rs. 50,000, and he had to struggle for subsistence. They were primarily engaged in agricultural activities as daily wage laborers. However, this did not provide them with sufficient income for subsistence. Therefore, he desired to establish a shop where he could offer immediate and essential photocopying and printing services to the residents of his gram panchayat. People in the region had to travel about 30-40 km for such facilities.



## Problem Statement

Dumerpada village is a remote village and faces regular power cuts. There is limited access to basic digital services such as photocopying, printing etc. due to lack of infrastructure. People in the region had to commute about 30-40 kms for basic photocopying and printing purposes.



## Solution

SELCO Foundation supported Haru Majhi to set up his solar powered Kiosk center. To finance the centre, State bank of India supported it with a loan under the MUDRA scheme.



## Impact

Haru Majhi has set-up his center with a laptop and a printer. He is providing uninterrupted services to the local people who live nearby. With a reliable and constant power supply, Haru Majhi is able to work productively throughout the day and even even during the night. He also purchased a camera to provide photography services. He has a monthly income of Rs.7000-Rs.8000 and profit of Rs.2000-Rs.3000.

Financial Details	Technical Details
Total cost of the project: Rs.1,11,000	Solar module: 75Wp, No - 3
Bank loan through SBI, Th.Rampur : Rs.86,000	Solar battery: 150Ah, No -2
Margin money- 25,000	Inverter: 850Va
Risk Gurantee:Rs.45,000	Laptop, Printer (1), Photoprinter (1) and Camera
Interest rate: 9%.	
Tenure: 60 months	

# PMEGP Scheme Case Study

## Tailoring Unit Women Entrepreneurs, Mayurbhanj

Ms. Chandrakanti Naik

05



Mayurbhanj, Odisha

*“We wanted the poor and uneducated women of our village to get engaged in some productive work. So, we motivated them to take up tailoring work. Now they are very happy as they have a means of earning and also helping other women to become self-sufficient”*

*-Ms. Chandrakanti Naik*



### Background

Ms. Chandrakanti Naik, Ms. Sangeeta Naik, Ms. Jayanti Naik, Ms. Kabita Sankua, Ms. Ahilya Patra, Ms. Baghya Lakshmi Sahoo and Ms. Priti Puspa Rout own a tailoring unit in Balkhalari, Kaptipada block of Mayurbhanj district in Odisha. These women belong to various self-help groups and have a poor socio-economic background. However, they had basic knowledge of tailoring work. This would give them the opportunity to enhance their skills as well as develop self-confidence and self-reliance



## Problem Statement

Kaptipada is a community development block that lies within a triangle of a wildlife reserve and is hence prone to frequent power cuts. Due to this limitation, the tailoring unit members used manual machines without a motor and this prevented them from meeting the increasing demand. It resulted in lower-income earnings, around Rs. 2,500 - Rs. 3,000 per month



## Solution

From the awareness program conducted by the CEE - Clean Energy Enterprise “Tarini Enterprise”, the women entrepreneurs of Badkhaladi came to know about DRE based solutions and approached the CEE team for a solution for their tailoring unit. SELCO Foundation supported the entrepreneurs in preparing bank proposals and the CEE team themselves followed up with the District Industries Centre (DIC) Manager to unlock the finance under Prime Minister’s Employment Generation Programme (PMEGP). PMEGP is a scheme that aims to provide financial assistance to set up self-employment ventures and generate sustainable employment opportunities in both rural and urban areas. After proper due diligence of the sites, The DIC manager forwarded the application to the service area bank (Odisha Gramya Bank, SBI, and Bank of India) for disbursement of the loan. A ten-day training on stitching was also organized by the DIC at the block office and the participants were awarded training certificates.



## Impact

The women entrepreneurs have a plan to expand their business. They have started taking orders from ready-made shops to increase their income.

Financial Details	Technical Details
Total cost of the project (7 end users): Rs.9,00,000	Solar module: 150 Wp,12V, No - 2
Bank Loan through Odisha Gramya Bank, State Bank of India and Bank of India	Solar Inverter: 1100VA, 12V
Interest rate: 10%	Solar battery: 150 Ah,12V, No - 1
Tenure: 60 months	LED Bulb : 9w, No - 2
	Fan - 1 no

# PMEGP Scheme Case Study

## Pottery Production Cum Training Centre, Kalahandi

Mr. Kaibalya Rana

06



*“The solution has been very beneficial as this has increased productivity, income and also my children are benefited by getting good education”*

*- Mr. Kaibalya Rana*



### Background

Mr. Kaibalya Rana has been doing pottery for the last 20 years, and it has been his primary source of livelihood. He is well versed in making Pots, Diya, Juice Glass, etc. and terracotta arts. He is a renowned terracotta potter and also a master trainer for DIC (District industrial centre) in Kalahandi district. He provides training 3 times a year. Through Odisha Rural Development & Marketing Society and DIC, he showcases his product and sells in district and state level Melas/Fairs.





## Problem Statement

The art of making pottery and especially as a means of livelihood is drudgerous. Right from mixing and kneading the clay, to running the wheel, all are time consuming and strenuous processes. The productive months need preparation and continuous work which, generally falls during the summers. The temperatures here during peak summers reach as high as 38 C. Firing the clay is an important process in making the product, which adds up to the ambient temperature of the workplace. The grid power that was connected to his house had frequent power cuts, which had led to the loss in working hours and hence hampered output. This also restricted him from thinking beyond, and exploring the mechanisation of his processes.



## Solution

SELCO Foundation After assessing the needs of the end users, Selco Foundation provided Solar powered DC Pottery wheel-01 (0.25Hp), solar powered Blunger machine-01 (0.25Hp), solar powered Jigger Jolly machine-01(0.25 Hp), AC Pugmill machine-01 (1Hp), Energy optimised and thermally comfortable pottery shed (700 sqft) and improved solar powered Jigger Jolly machine.



## Impact

There has been an increase in production and income. During the pre-intervention phase, the monthly income was about Rs.10,000. But, post-intervention, he is earning an amount of Rs.20,000 per month. Due to the intervention, his son could study in an English medium school and does not face any interruption due to a reliable supply of energy for lights and fans. He could study well without any interruption. Reduction in drudgery to great extent. He has received pottery training from DIC and also imparts training to potential potters. Improved technical specification and design of machines directly impacting the vendor's business of giving right solutions to other potters buying machines from them.

Financial Details
Total cost of the project: Rs. 23,28,550
PMEGP loan sanctioned by Indian Bank: Rs. 5,00,000
Gap finance support by SELO Foundation: Rs. 17,98,008
End user contribution: Rs. 30,542

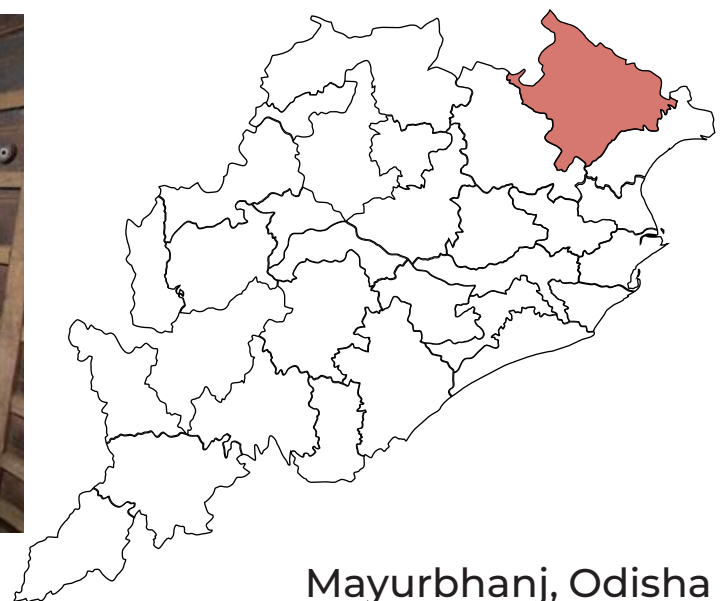
Technical Details
Solar module: 320 Wp, No - 2
Solar battery: 150 Ah, No - 2
Energy optimised and thermally comfortable
Pottery shed (700 sqft)

## 2.2 Cluster Based Financing for Multiple HHs / Livelihood solutions:

### Odisha Gramya Bank Case Study

#### Solar Home Lighting for Tribal Households, Mayurbhanj

07



Mayurbhanj, Odisha

*“Solar powered lights have helped us immensely. We can now perform household work easily, there is no fear of any danger due to darkness. Even our children can study better due to the lights”*



### Background

Kaptipada block in Mayurbhanj district in Odisha, with a population of over 1,00,000 is one of the under-served districts in the country. The district houses close to 503947 households (Census 2011), but only 28% of the rural households have access to electricity and only 40% in the rural region avail banking facilities. The community belongs to scheduled tribes with an annual income of less than Rs 40,000.



## Problem Statement

Kaptipada block of Mayurbhanj district is a remote region that is deprived of several basic amenities such as reliable energy for electricity, water, road, communication, transportation, etc. Despite grid connection for several households, neither reliable electricity is available nor timely repairs on time. This results in households not having electricity for weeks or months, especially during the monsoon.



## Solution

SELCO Foundation, in partnership with Odisha Gramya Bank, Sarat branch and a solar enterprise Tarini Enterprise lightened the lives of about 60 tribal households in the block. They were provided with LED lights and fans with solar connection.



## Impact

The solar home lights provided have been very helpful for their children's education and for household work during the evening hours. They are helpful during the rainy season when the village, surrounded by hills and forested areas, suffers from a power shortage for 6-8 days. This has also reduced electricity costs and kerosene consumption and minimized air pollution. The households now enjoy a better quality of life and stronger savings.

Financial Details	Technical Details
Total cost of the project (60 HHs): Rs. 8,10,000	Solar module: 50Wp, No - 1
Bank Loan through Odisha Gramya Bank: Rs. 7,20,000	Solar battery: 40Ah, No - 1
Risk guarantee to initiate unlock of DRE financing: Rs. 2,67,300	Charge regulator: 6amps
Interest rate: 9%	LED Bulb: LED 5w and 3w (1 no. each)
Tenure : 48 months	Fan : 11 watt (1 no.)

# Syndicate Bank Case Study

## Sewing Machine Cluster, Balasore

08



Balasore, Odisha

*“Solar powered sewing machines have helped us immensely. Due to erratic power supply it was difficult to complete orders and increase production, but now we can. The bank loan was very useful to get solar connection and gave us a stable work and income*



### Background

Goverdhanpur village under Jaleswar block of Balasore district has a community called Jogi. This community has experienced a traditional tailoring group with a successful tailoring micro-unit in the village for many years. The Jogi community consists of 180 households that are traditionally engaged in tailoring business. They supply school dresses and readymade clothes for kids, men and women in Balasore District. They have a strong market base to supply their products.



## Problem Statement

Due to erratic power supply, they had to face many challenges. They could not cater to the demand on time, and massive losses in the production of clothes subsequently hampered the business's profit. Impact of unreliable electricity on their daily lives and the severity of the issue among the community.



## Solution

SELCO Foundation After assessing the needs of the end users, Selco Foundation provided a solar solution to their existing sewing machine. However, as per the solar power design, the cost of the system could have been more affordable for the community. The community requested credit linkage to repay the cost of the system in monthly instalments. So, the local enterprise "Aurosharee Traders" submitted the proposal to different local banks for the finance linkage of interested households for solar power sewing machines. Later, Canara Bank of Jaleswar financed five households with a risk guarantee to secure their NPA, and after successful repayment by the end users, the same branch financed five other households without a risk guarantee for sustainable livelihood through renewable energy.



## Impact

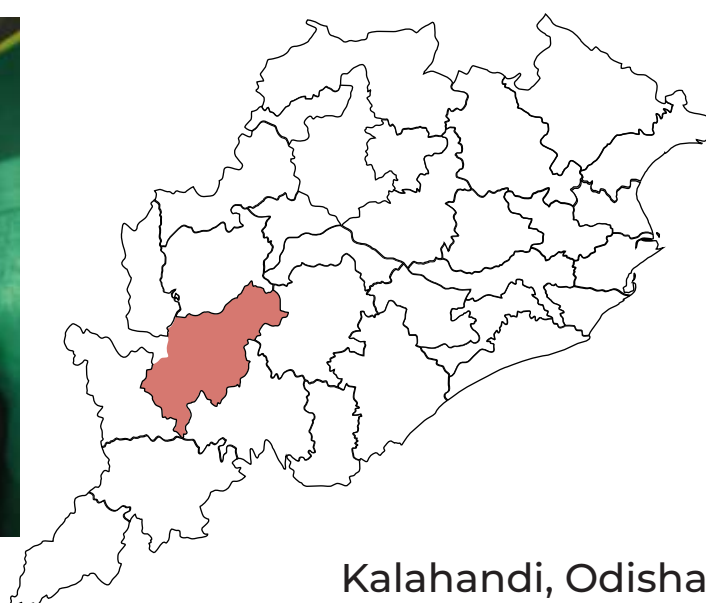
Now the community can increase their income by improving their production & repaying the EMI to Syndicate Bank timely. The entrepreneurs have a plan to expand their business. They have started taking orders from readymade shops to increase their income.

Financial Details	Technical Details
Total cost of the project (10 end users): Rs. 3,95,000	Solar module: 165 Wp,12V, No - 2
Bank Loan through Syndicate Bank (As now Canara Bank): Rs. 3,65,000	Solar Inverter: 1100VA, 12V
Risk guarantee support for 5 households: Rs. 1,21,250	Solar battery: 120 Ah,12V, No - 1
Interest Rate : 10%	LED Bulb : 9w, 3 no. each
Tenure: 60 months	Fan - 1 no.

# Nabkisan and Cooperative Bank Case Study

## Pulses Processing Unit, Kalahandi

09



Kalahandi, Odisha

*“Decentralized processing solutions have been beneficial for the FPC and other beneficiaries at local level as this has reduced operation cost, drudgery and caters to a larger population. The finance unlocking has been very beneficial in setting up the unit”*



### Background

With increased pulses production in the state, the farmers gradually get hold of the decentralized mills. Pulses also promote sustainable agriculture as pulse crops help decrease greenhouse gas emissions, increase soil health and use less water than other crops. Odisha has good potential to establish pulse processing mills as many districts are engaged in pulse cultivation.



## Problem Statement

The Bamunikhol FPC (Farmer Producer Company) is promoted by AFC India promotes the Bamunikhol FPC (Farmer Producer Company) with the help of NABARD in the Bhawanipatna block of Kalahandi. The FPC is associated with more than 380 farmers engaged in pulses cultivation. The farmers in the panchayat need reasonable prices for their harvested pulses as middlemen purchase the commodity at a low price. This discourages the farmers from producing and selling pulses. Due to the unavailability of pulses mills in the vicinity, farmers usually travel 8-10 km to process daal. Moreover, the area is situated in an isolated and completely off-grid area with no power supply. Drudgery & physical pressure were significant challenges as earlier women farmers adhered to home-based manual stone-operated pulse processing at the household level.



## Solution

The FPC was provided with the solution of a 2HP Daal (pulses) mill and 1HP Daal grader machine with 4 hours of solar backup system. The FPC has leveraged loans from NABKISAN and Bhawanipatna Cooperative Bank for setting up the pulses processing unit.



## Impact

The model provided services to more than 400 HHs of nearby 11 villages and established rural enterprises. The FPC plans to sell the polished daal in the market with support from ORMAS. The FPC has procured about 16 quintals of pulses from farmers at a rate of Rs.55 per kg and plans to process and sell them at Rs.95 per kg. Drudgery has reduced for women farmers. They no longer lose wages or incur transport costs in day-long travel to central processing units. Local travel has minimized for local farmers and now they are able to get milling services at their own village and gram panchayat. FPC members, local agri-entrepreneurs and farmers from other areas are receiving technical knowledge from the unit.

### Financial Details

Total cost of the project: Rs.17,45,500

Total Loan - Rs.8,50,000  
(NABKISAN - Rs. 3,50,000 and Bhawanipatna Cooperative Bank- Rs. 5,00,000)

NABARD (Grant): Rs. 3,55,000

Gap finance support from  
SELCO Foundation: Rs. 4,95,000

End user contribution: Rs. 45,500

Interest rate: 8.80%

Tenure: 30 Months (10 Quarters )

### Technical Details

#### Machinery Equipment:

- Pulses processing unit
- Four wheeler - Pick up van
- Shed preparation

#### Solar Equipment:

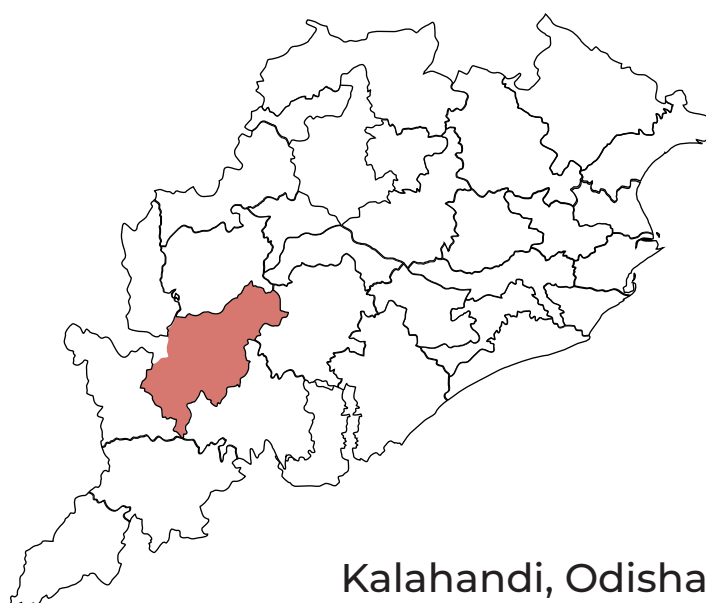
Solar module: 330 Wp, 24 V. No - 10  
Solar battery: 200 Ah, 12 V. No - 8  
Inverter: 6 Kw,7.5 Kva, 96 v

## 2.3 Group Based Financing for FPCs / PGs / SHGs:

### Gram Panchayat Level Federation (GPLF) Fund Case Study

#### Puffed Rice Unit, Kalahandi

# 10



Kalahandi, Odisha

*“Earlier, we didn’t had any means of earning, but now the unit has shown us a path for development. We can contribute to household income and make our living better”*



### Background

Kalahandi district has immense potential for such activities as massive demand for puffed rice. Birikote village is a tribal village of Thuamul Rampur block of Kalahandi district. The sustainable energy intervention has been implemented due to its demand for producing and consuming puffed rice.





## Problem Statement

Since no puffed rice unit is within 20 km, people usually travel 20 to 30 kilometres to buy puffed rice. This led to the adoption of a traditional manual puffed rice preparation method by some women at their homes, which involved manual work and drudgery. They require a constant power supply to process the rice/paddy since their working hours also extend to late evening. However, due to frequent power failures (avg of 3-4 hrs /day) during working hours, they cannot work comfortably and maintain the flow resulting in delays in fulfilling the work orders and huge losses of rice. Lack of technology awareness, poor working environment and market fluctuations have affected production.



## Solution

In order to enhance the livelihood of the women groups through increased production, income and better working conditions, solar-powering of the puffed rice unit has been undertaken in partnership with OLM. This is a group-based model that leverages OLM Gram Panchayat Level Federation (GPLF) loan. The SHG was supported with a 1Hp-3 spindler puffed rice unit, with a solar energy system to run 1Hp Motor (750W), stand fan (100W) and lights (10W) for the workspace at Birikote village.



## Impact

Solar puffed rice unit has helped the women to overcome the impediments in preparation due to non-availability or erratic supply of electricity after evening and provide a hassle-free environment to work at night. The women found positive changes with regard to their productivity, income and socio-economic condition. It is a means of earning for them as now they are having a monthly revenue of Rs 90,000, expenditure of Rs 76,500 and income of Rs 13,500. People of about 15 villages are getting the service from the unit. The unit has empowered the women of the SHGs and other women in the village to be self-sufficient and self-confident. They are able to make decisions and contribute to the family in an efficient manner.

### Financial Details

Total cost of the project: Rs 4,25,255

GPLF Loan: Rs 1,00,000

Gap finance support for decentralized renewable energy ecosystem building:  
Rs 2,95,255

End user support: Rs 30,000

Interest: 6%

Tenure: 12 months

41

### Technical Details

Solar module: 325Wp, 24V, No - 6

Solar battery: 200Ah, 12 V, No - 4

Inverter: 3Kw 48V, No - 1

LED Bulb and Fan: LED 10w,  
Fan - 100W

# Block Level Federation (BLF) Fund Case Study

## Readymade Garment Production Unit, Kalahandi

11



Kalahandi, Odisha

*“We wanted the poor and uneducated women of our village to engage in any productive work. So, we convinced them to take up tailoring work. Now, they are much more self-confident and self-reliant “*



### Background

Basic tailoring and garment-making techniques are an elementary and foremost need to develop sustainable rural, urban and even tribal livelihood among the people. Every household has a basic demand for apparel. So, the trade tailoring and garment making plays an important role among the rural women folk to help their families and maintain their minimal livelihood through these trades. This also gives women employment opportunities in remote areas and renders fast service.



### Problem Statement

The machines in the unit were motor-driven through a normal grid supply. Power failures and voltage issues are widespread in the area, especially during summer and rainy seasons, due to which the women were finding it difficult to work and complete their orders on time. The average power cut in a day is about 3 to 4 hours. Besides, every half, an hour or one-hour power failure happens for 10 to 15 mins, breaking the workflow. They could also not work after sunset to keep the orders on time.



## Solution

Mrs Hemlata Sahu, Mrs Jharana Sahu and other women members of the PG are managing the unit. The PG was provided with the solution of AC solar-powered sewing machines (4 Juki sewing machines and 10 AC full round sewing machines)



## Impact

Before the intervention, they stitched less than 15 pieces daily and sold at @Rs 300-600 per product, depending on the quality and design. They used to earn an income of Rs 6000-7000 for working about 23-24 days a month. However, productivity has increased by more than five pieces per day, i.e. more than 20 pieces, and the women have seen an immediate increase of INR 4500-5000 per month. Further, solar lights and fans in the unit allowed them to work in the evenings, thus giving them the flexibility to take a large number of orders. They are paying the monthly instalments regularly. Also, market linkages increased through local markets and online platforms like Amazon, Snap Deal and Flipkart. Women also became more confident, and their well-being as women entrepreneurs has been maintained. Presently, the unit has expanded vastly, with an annual turnover of 17 lakhs for the last three months through an order by the Govt to manufacture school uniforms for all the schools in the block. They are getting a profit of Rs 100 per uniform, excluding all expenses. A total of 22 people are working in the unit, and there are 72 machines. They are receiving about 10% profit on an average.

Financial Details	Technical Details
Total cost of the project: Rs 5,28,320	Solar module: 330 WP, No - 12
BLF Loan: Rs 1,00,000	Solar battery: 200 Ah, No- 8
Gap finance support for decentralized renewable energy ecosystem building: Rs 4,28,320	AC Sewing machine motor (SAMART-High speed): 225w, No-9
Interest: 6%	AC Sewing machine Motor (OLIVE): 180w, No-1
Tenure: 12 months	Juki Industrial sewing machine: 250w, No-2
	Juki lockstitch sewing machine: 250w, No-2
	AC LED Lights: 20w, No-10
	AC Fan: 32w, No-6

## Scaling Processes and Way Forward

Scaling up these processes will require more concerted efforts across other aspects of the financing ecosystem. There are also a number of opportunities that can be capitalized on to advance the efforts around developing appropriate financial products and mechanisms to support the most vulnerable communities looking to access energy solutions. Some of these are outlined below:

a. **Convergence with existing schemes:**

Schemes like Pradhan Mantri Awaas Yojana (for housing) have provisions for providing loans along with grant support to poor and vulnerable households for construction of houses. Energy loans (with concessional credit instruments or gap financing) can be integrated allowing households to access energy using DRE solutions alongside basic housing. Similarly, integrating energy into schemes for disaster relief and rehabilitation can ensure more holistic solution provision where energy access needs become a part of the solution for disaster relief. This would require building the capacity of financial institutions as well as ministries and departments on the linkages between their portfolio and energy access, and then building out appropriate financial models depending on the end-user typologies and context.

b. **Affordable capital and support for creating ecosystems:** With more than 900 million people still lacking access to basic electricity, there is a strong case to be made for strengthening ecosystems and enabling financing for decentralized sustainable energy solutions. This requires:

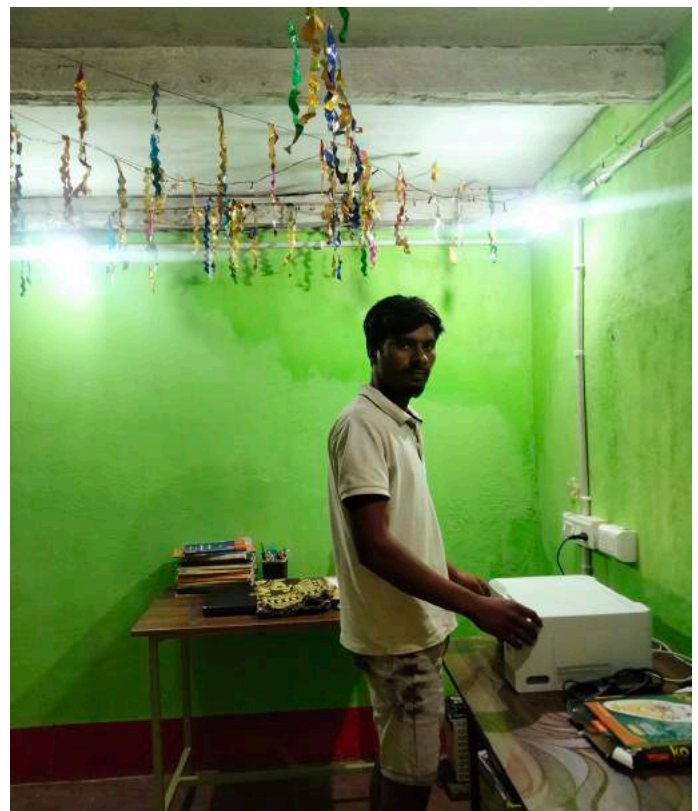
i. **Reductions in cost of capital:** At an international level, multilateral agencies and banks need to provide low cost capital to local financial institutions to be able to onlend to end-users for basic infrastructure needs such as energy access. Long term, low cost infrastructure capital can only be availed by poor communities on the field, only when there is commitment at the highest rungs of banking and finance.

ii. **Support for local energy enterprises and NGOs:** These institutions are critical in building the decentralized clean energy ecosystem. They also support financial institutions in last mile efforts of identifying end users, documenting their needs, designing solutions, installing and maintaining energy systems and enabling collections. Credit availability and evaluation of credit worthiness should be managed independent of these functions of support provided by NGOs and enterprises. This means de-linking the efforts in a way where the financial institution stays responsible for

evaluating credit worthiness and providing credit while the local enterprise and field NGOs focus on the effort of identifying potential end-users, designing and installing solutions and maintaining them. Availability of low cost capital for financial institutions that already have strong penetration within the community can be instrumental in this effort to de-link roles and allow each stakeholder to work together rather than take on responsibilities beyond their expertise.

c. **Scale through appropriate channels, associations and institutions:** Scaling solutions across regions of Sub-Saharan Africa, South Asia and South-East Asia (where energy access indicators are still lagging behind) requires that these processes are scaled through all appropriate channels and associations.

i. **Training:** In the absence of banker training institutions, there may be industry bodies or associations of Micro Finance Institutions (MFIs) that can enable interactions with financiers. For example, As part of Global replication efforts, SELCO Foundation has worked closely with the Tanzanian Association of Micro Finance Institutions (TAMFI) to build capacity and help design financial products that can be used for energy lending. Training modules and appropriate financial products need to be built keeping in mind the different end-user typologies relevant for each region.



ii. **Financial product design and disbursement:** In the absence of active banks or MFIs in a region, there is opportunity for NGOs and energy enterprises to build on local saving-credit channels such as the SACCOs in Kenya, the RoSCAs in Nigeria and so on. All of these institutions typically have some linkages with banks to access credit and can integrate energy lending within their portfolio. Being on the ground, their transaction costs will also be lower than that of banks in cities.

Basic energy access for households is a critical need and can form the backbone to develop other linkages between energy and development. With access to affordable credit being a key pillar, building a conducive financing ecosystem for energy access is imperative. It needs to begin with an identification

of target end-user typologies and the state of the current ecosystem in that region- existence of FIs, types, maturity, activeness etc.

The kinds of processes to be scaled, across the broad phases of end-user engagement, financial solution design and disbursement, and collections and after-sales support, can then be mapped onto regions based on their existing ecosystem and target end-user typologies. Ensuring the availability and accessibility of affordable capital for FIs to build an energy access portfolio, capitalizing on schemes that mobilize credit for other household needs and building on institutions, savings-credit channels that already exist will be critical in moving the needle in bringing energy access to the 900 million people who still lack this basic need across the world.





## 175 Livelihood Solutions

SELCO Foundation seeks to inspire and implement sustainable energy driven solutions that alleviate poverty. These sustainable energy driven solutions inclusive of energy efficiency and green built environments are aimed at improving quality of life and livelihoods. SELCO firmly believes that an end-user centric, demand driven approach that focuses on ecosystem building, leads to interventions that are long-term and replicable.

The 175 solutions in this book span across livelihood sectors and showcase sustainable energy driven solutions for varied productive use across agriculture, animal husbandry, micro businesses and textiles and crafts.

Scan this code to view the full report







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