Renewable Energy and Women Entrepreneurship Programmes

Photo: UN Environment Programme

A GUIDEBOOK IN DESIGN AND IMPLEMENTATION

ΣmPower
Women for Climate-Resilient Societies

UN environment programme

ISBN No: 978-92-807-3953-4
Job No: ROAP/2450/BA

Suggested citation: United Nations Environment Programme (2022). Renewable energy and women entrepreneurship programmes: A guidebook in design and implementation. Bangkok.

Acknowledgements

UN Environment Programme (UNEP) thanks the Swedish International Development Cooperation Agency (Sida) for funding the preparation and production of this report, which is part of the programme entitled EmPower: Women for Climate-Resilient Societies, jointly implemented by UN Women and UNEP.

AUTHOR
Fiza Farhan

EDITORS
Parimita Mohanty, Programme Management Officer for Renewable Energy, UNEP
Annette Wallgren, Programme Management Officer for Gender and Climate Change, UNEP
Paulene Maria Isabelle Santos, Communications Expert for Gender and Climate Change, UNEP

Valuable contributions were made by the following external reviewers to the development of this report: Vatanak Chheng of the National Committee for Sub-National Democratic Development (NCDD) in Cambodia; Cao Van Ha, Nguy Thi Khanh and Nguy Thi Ha of the Green Innovation and Development Center (GreenID) in Viet Nam; Nguyen Van Anh of CHIASE in Viet Nam; Chanvibol Meng of Nexus for Development in Cambodia; ShadmaChann bin Zahir of the Infrastructure Development Company Limited (IDCOL) in Bangladesh; Dr. Debajit Palit of The Energy and Resources Institute (TERI); Afshana Choudhury and Matin Abdullah of the Centre for Entrepreneurship Development, BRAC University in Bangladesh; Dr. Sebastian Groh of SOLshare Ltd; Raluca Dumitrescu of Microenergy International; Nisha Onta of Women Organizing for Change in Agriculture and Natural Resource Management (WOCAN); Joyashree Roy of the Asian Institute of Technology (AIT); Pierre Cazalles of the International Copper Association (ICA); Annette Aharonian of Sustainable Energy for All (SEforALL); Jamil Khan of Agha Khan Rural Support Network (AKRSP); Dr. Naveed Arshad of Lahore University of Management Sciences (LUMS) Energy Institute; Nameerah Hameed of the Pakistan Women in Energy Network; Soma Dutta of ENERGIA; Jens Jaeger of Alliance for Rural Electrification (ARE); Niken Arumdati of the Energy and Mineral Resources Provincial Office of West Nusa Tenggara in Indonesia; and Thomas Andre of REN21.

Contact Us

UN Environment Programme in Asia and the Pacific
Email: uneproap@un.org | Facebook: @UNEPROAP |
Twitter: @unep_asiapac

www.empowerforclimate.org

Sweden
Sverige

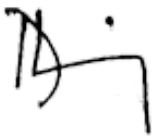
Foreword

Over the last decade, there have been a number of programmes that successfully integrated renewable energy, gender equality, and climate change adaptation and mitigation in aid of the Sustainable Development Goals' achievement. However, the key lessons from these initiatives and the approaches that were applied in their design and implementation had not always been captured and shared widely with relevant stakeholders. This prevents such programmes from being replicated and scaled up so that more individuals and organizations can work on harnessing the potential of renewable energy as a viable solution that addresses gender inequality in climate action.

It is our hope that **Renewable Energy and Women Entrepreneurship Programmes: A Guidebook in Design and Implementation** takes us a step closer to bridging this gap by serving as a user-friendly tool that aids the process of developing and executing sustainable, renewable energy-based women entrepreneurship programmes. The guidebook was completed under the project entitled EmPower: Women for Climate-Resilient Societies which is jointly implemented by UNEP and UN Women, and funded by the government of Sweden. Since 2018, the project has been supporting women entrepreneurs to use renewable energy for climate-resilient livelihoods so the methodologies that helped enable this have greatly informed the content of the guidebook.

We believe that strengthening gender equality in renewable energy within the Asia-Pacific region is especially relevant as it is not only one of the most vulnerable to climate change's adverse impacts but gender mainstreaming and female representation in the renewable energy sector in particular, has been historically limited in many countries across the region. This is mostly due to pre-existing gender inequalities that have prevented investments in renewable energy from translating to equal access to jobs for women or to services and resources that might allow them to engage in the sector.

This is a lost opportunity, especially in the context of Covid-19, as empowering women to become climate-smart entrepreneurs using renewable energy can bring multiple socio-economic benefits that better ensures a green recovery from the pandemic. However, with this guidebook in hand, we look forward to more actors coming together to support renewable energy-based enterprises that empower women and enable them to build a better future for themselves and their communities.



Dechen Tsering
UNEP Regional Director and Representative for Asia and the Pacific


Photo: UN Environment Programme

Table of Contents


Photo: UN Environment Programme

Glossary of Terms

AIT	Asian Institute of Technology
AKRS	Agha Khan Rural Support Network
CBO	Community-based Organization
CERF	Clean Energy Revolving Fund
CSO	Civil Society Organization
CSR	Corporate Social Responsibility
DFAT	Australian Foreign Affairs and Trade Department
DRR	Disaster Risk Reduction
EOWS	Energy Opportunities for Women in Senegal
GreenID	Green Innovation and Development Center
ICS	Improved Cook Stoves
ICT	Information and Communication Technology
IDCOL	Infrastructure Development Company Limited
IFC	International Finance Cooperation
LABL	Lighting a Billion Lives


Photo: UN Environment Programme


Photo: UN Environment Programme

LAML	Lighting a Million Lives
LUMS	Lahore University of Management Sciences
MFO	Market Facilitation Organization
NCDD	National Committee for Sub-National Democratic Development
NGOs	Non-governmental Organizations
RE	Renewable Energy
REEWF	Renewable Energy Empowering Women Farmers
SCODE	Sustainable Community Development Services
SDGs	Sustainable Development Goals
SE4ALL	Sustainable Energy for All
SHG	Self Help Group
TERI	The Energy and Resources Institute
TIDE	Technology Informatics Design Endeavour
TOT	Training of Trainers
VBSP	Vietnam Bank for Social Policies
WEE	Women's Economic Empowerment
WOCAN	Women Organizing for Change in Agriculture and Natural Resource Management
UNEP	United Nations Environment Programme

Chapter 1

Introduction to EmPower: Women for Climate Resilient Societies

The United Nations Environment Programme (UNEP) and UN Women have been jointly implementing the project EmPower: Women for Climate Resilient Societies since 2018. EmPower aims to contribute to the overall outcome of countries in Asia and the Pacific being able to implement gender-responsive climate change and disaster risk reduction actions to address key drivers of gender-based vulnerabilities.

The Asia-Pacific region is one of the most vulnerable to climate change. Due to gender inequalities, women and marginalised communities suffer the brunt of climate change's negative impacts. Thus, UNEP and UN Women are supporting those who are among the worst affected.

EmPower works to enhance women's resilience to climate change in Bangladesh, Cambodia, and Viet Nam. At the regional level, the project also works to influence frameworks and policies on climate change and disaster risk reduction (DRR) so that these integrate gender equality and a human rights perspective.

One of the key elements of EmPower, that is led by UNEP, is supporting women entrepreneurs using renewable energy

Photo: UN Environment Programme

(RE) livelihoods. Through detailed studies and a carefully designed approach, UNEP has been working with women, the private sector, national as well as sub-national governments, civil society organizations (CSOs), banks, financial institutions and community-based organizations (CBOs) in Bangladesh, Cambodia, and Viet Nam.

The breadth of knowledge and evidence that has been gathered through the years of implementation has been captured in this guidebook, with many thanks to all the partners that have ensured the methodology is well-designed for the communities it is aimed to support. It was prepared based on EmPower's own experiences as well as various methodologies tried by diverse practitioners around the region with best practices and learnings from regional stakeholders incorporated.

The purpose of this guidebook is to provide practitioners and donors with a step-by-step methodology to design or fund and implement renewable energy women enterprise projects, using the hands-on experiences from EmPower. The guidebook will ensure that the practitioners and donors do not have to reinvent the wheel by presenting approaches they can adapt in the design and implementation of renewable energy and women enterprise development projects.

Photo: UN Women/Pornvit Visitoran

Chapter 2

The Nexus Between Energy Access and Women's Economic Empowerment

Photo: UN Environment Programme

Ensuring women's access to energy and economic empowerment is important because of both their socio-economic position in rural communities and their vulnerability to climate change impacts. The effects of climate change across the region are being shaped by pervasive and entrenched gender inequality; and women in developing countries are particularly vulnerable to climate climate change because they are highly dependent on local natural resources for their livelihood.

In most areas, women experience unequal access to resources and decision-making processes, with limited mobility in rural areas. Moreover, socio-cultural norms can reduce women's chances of gaining the information and skills necessary to escape or avoid hazards, rendering them more vulnerable to disasters and other harmful effects of climate change as seen in Figure 1. At a broader level, challenges in accessing all levels of policy and decision-making processes also means that women are unable to influence policies, programmes, and decisions that impact their lives.

Similarly, a lack of sex disaggregated data in all sectors (e.g., livelihoods, disasters' preparedness, protection of environment, health and well-being) results in an underestimation of women's roles and

contributions particularly in the informal sector/rural areas. This results in the formation of gender-blind climate change policies and programming, which fails to incorporate the gender differentiated roles of both women and men. The cumulative effects of poverty and social, economic and political barriers means that women will almost always be at a disadvantage in tackling climate change and its negative effects.

Table 1 lists some of the best practices of women-led renewable energy enterprise projects around the world that have been studied and whose proponents were consulted during the preparation of the guidebook. In addition to these global best practices, critical inputs were drawn from the partner organizations involved in the implementation of EmPower for a more holistic approach in creating a comprehensive guiding document for the development of sustainable women-led RE enterprises in the region.

Figure 1. Gendered Impacts of Climate Change

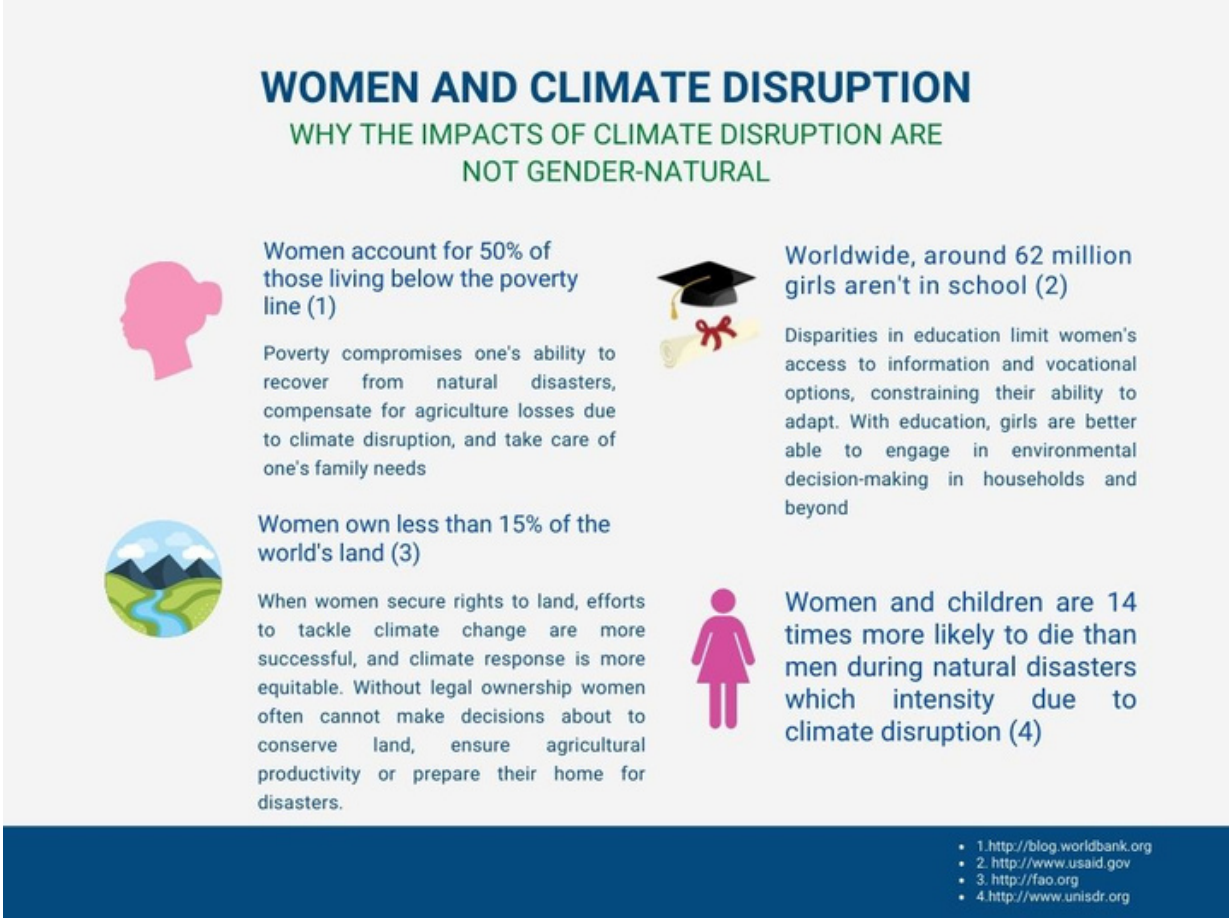


Table 1. List of Global Best Practices Generated from Women-led RE Enterprises

PROJECT NAME	ORGANIZATION/S	LOCATION	LINK
EmPower: Women for Climate Resilient Societies	UNEP, Nexus for Development, NCDD	Cambodia	https://nexusfordevelopment.org/project/empower-women-for-climate-resilient-societies/
EmPower: Women for Climate Resilient Societies	UNEP, IDCOL, SREDA	Bangladesh	https://www.empowerforclimate.org/en/where-we-work/bangladesh
EmPower: Women for Climate Resilient Societies	UNEP, CHIASE, GreenID	Vietnam	https://www.empowerforclimate.org/en/where-we-work/vietnam
Integrating women Into Grameen Shakti's Renewable Energy Value Chain in Bangladesh	Grameen Shakti	Bangladesh	https://www.energia.org/assets/2017/01/2014-Bangladesh-IntegratingWomenRenewableValueChain.pdf
Mainstreaming Gender in Energy Projects: A Practical Handbook	Energia	Global	https://ppp.worldbank.org/public-private-partnership/sites/ ppp.worldbank.org/files/documents/Energia_Mainstreaming_gender_in_energy_projects_A_practical_Hand_book.pdf
Innovative Clean Energy Finance for Cambodian Farmers	CERF, Nexus	Cambodia	https://www.reeep.org/projects/innovative-clean-energy-finance-cambodian-farmers-nexus
Lighting a Million Lives	Buksh Foundation	Pakistan	https://www.youtube.com/watch?v=5BX8Z8q42LM
Solar Sister – A Green Energy Revolution Powered by Women's Enterprise	Solar Sister, Energia	Nigeria, Tanzania, Uganda	https://solarsister.org/
Energy Opportunities for Women in Senegal (EOWS)	Energy 4 Impact, Energia	Senegal	https://energy4impact.org/news/empowered-women-securing-energy-access-rural-senegal
Women in Energy Enterprises	Practical Action Consulting, Energia, Sustainable Community Development Services (SCODE)	Kenya	https://www.energia.org/practical-action-women-in-energy-enterprises-in-kenya/
Promoting Women-led Enterprises for Energy Access and Local Production	Centre for Rural Technology in Nepal, Practical Action Consulting, Energia	Nepal	https://swnepal.com.np/project/final-evaluation-study-of-promoting-women-led-enterprises-for-energy-access-and-local-production-wee-nepal/

Table 1. List of Global Best Practices Generated from Women-led RE Enterprises

PROJECT NAME	ORGANIZATION/S	LOCATION	LINK
Wonder Women Programme	Kopernik Solutions, Energia	Indonesia	https://kopernik.info/en/
Lighting a Billion Lives (LABL)	TERI (The Energy and Resources Institute)	India	https://www.teriin.org/energy-access
The Renewable Energy Empowering Women Farmers (REEWF) Project	Practical Action	Zimbabwe	https://www.energia.org/assets/2019/01/Supporting-Last-Mile-Women-Entrepreneurs.pdf
A Case of Improved Clean Cooking: Women Cookstove Entrepreneurs of the Sarala Stove Project	Technology Informatics Design Endeavour (TIDE)	India	https://www.developmentaid.org/api/frontend/cms/file/2020/02/women_in_energy_breaking_stereotypes_and_inspiring_change.pdf
Off-Grid Solar: Solar PV Mini Grid Installation in Jharkand	PRADAN, Gram Oorja	India	https://www.developmentaid.org/api/frontend/cms/file/2020/02/women_in_energy_breaking_stereotypes_and_inspiring_change.pdf
Supporting Last Mile Women Energy Entrepreneurs	Energia	Africa	https://www.energia.org/assets/2019/01/Supporting-Last-Mile-Women-Entrepreneurs.pdf
Empowering women entrepreneurs with solar kiosks & digital tools	Benoo	Togo	www.benoo.africa

Chapter 3

How the Guidebook Benefits Donors and Practitioners

This guidebook will attempt to highlight the essential factors that need to be incorporated in setting up a women's renewable energy-based enterprise in rural areas. This includes two different types of RE enterprises:

- RE for Enterprise: Using renewable energy for livelihood options
- RE as Enterprise: Selling RE products and services

It serves as a user-friendly tool for project developers who are planning to implement both type of projects and for donors interested in funding the same.

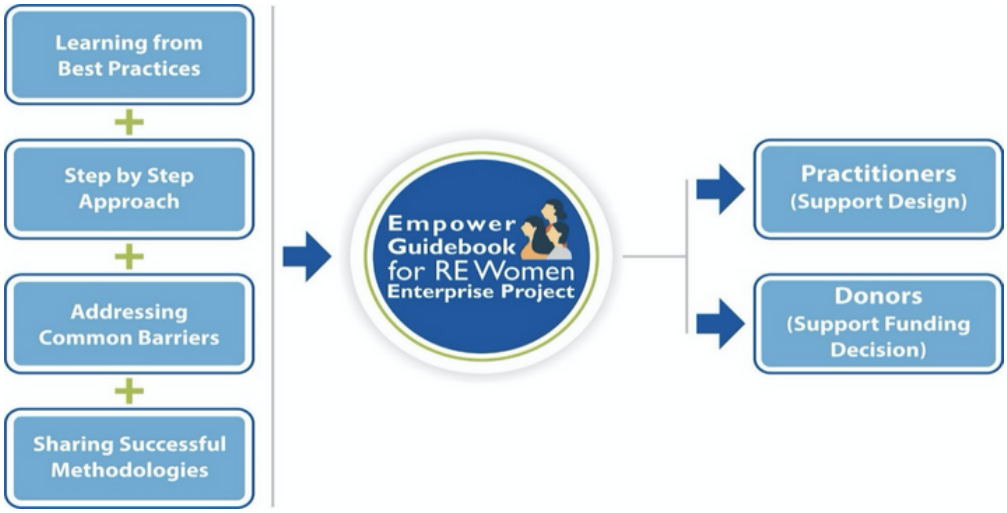
The guidebook has been informed by best practices of successfully implemented projects in developing countries, particularly in South East Asia. It focuses on renewable energy enterprises which empower women economically and socially, and defines the essential steps needed to be undertaken as part of planning for similar initiatives.

As such, local and international development organizations looking to implement renewable energy enterprises for women stand to benefit the most from this document as it can provide guidance and step-by-step directions on creating a successful model.

Photo: UN Environment Programme/CHIASE

The guidebook takes into account the barriers that practitioners might face; thus enabling them to avoid common mistakes such as those caused by the failure to incorporate specific cultural and social factors affecting their selected area. It also ensures that a practitioner or donor aiming to establish a rural business model impacting women-led energy enterprises learns from the best practices, failures, and learnings gathered from other models around the world. This is accomplished through a step-by-step narrative that aims to illustrate how a sustainable, scalable, and triple bottom line impact business model that provides access to energy for rural unelectrified or partially electrified villages while empowering women through enterprise development can be achieved. Figure 2 below effectively summarizes the same.

Figure 2. Elements in the Development of the Guidebook



Chapter 4

Methodology for the Development of the Guidebook

Photo: UN Environment Programme/GreenID

This guidebook is based on research conducted on women's economic empowerment projects around the world and consultations with stakeholders involved in renewable energy and women entrepreneurship in countries across the Asia-Pacific region including those who have been implementing EmPower in the three pilot countries of Bangladesh, Cambodia, and Viet Nam.

The initial assessment was conducted through an extensive desktop review of literature on women-based renewable energy enterprises with a focus on rural areas in developing countries. Best practices and lessons learnt from these projects were incorporated in the guidebook with special consideration for the cultural and economic conditions of the countries in which the renewable enterprises for women were being focused i.e., Bangladesh, Cambodia, and Viet Nam.

EmPower's experiences including the methodologies that were applied in the execution of successful projects, informative manuals and documents that had already been developed, and robust feasibility studies that had already been conducted were all incorporated in the development of the guidebook so that its content is practical, effective, and easy to implement.

Figure 3. Illustration of the 10 Step-by-step Approach

In addition to the extensive secondary review, expert consultations on global best practices contributed to a large extent in shaping a more holistic overview for the guidebook and ensuring practitioners and donors are presented with a comprehensive solution for the development of rural women-led RE enterprise models (both RE as enterprise and RE for enterprise) without having to reinvent the wheel.

Following the research, relevant stakeholders were shortlisted based on their expertise on renewable energy and women entrepreneurship initiatives. The consultations with EmPower partner organizations and other selected regional and global organizations were conducted virtually with the list of stakeholders provided in Appendix A.

Given that the project is implemented in Bangladesh, Cambodia and Viet Nam; local and international development organizations were contacted who had either been involved in similar projects in the region or had the capacity to act as implementing partners. In most cases, the heads of the organizations or directors of departments were engaged to get a more comprehensive picture of the activities and potential partnerships that such an initiative entails.

Based on EmPower's own experiences as well as through consultations with relevant national, regional, and international experts, this guidebook proposes a "10 Step-by-Step Approach", as illustrated by Figure 3, for practitioners and donors to follow in establishing successful, impactful, and well thought out women-led energy enterprise models.

Each of the 10 steps is accompanied by a checklist of the essential information that needs to be collected and a flowchart highlighting specific activities required for implementation. In addition, the boxes found for each step


Photo: UN Environment Programme/CHIASE-Pornvit Visitoran

to provide details of case studies and best practices from EmPower's partner organizations from the region as well as success stories of women entrepreneurship and renewable energy initiatives from around the world. Further to this, wherever possible, a list of reference documents is presented featuring examples for practitioners and donors to customize and build on for their individual business models.

Through this process of collective knowledge sharing, this guidebook aims to present a holistic, easy to understand, and actionable approach for stakeholders to successfully launch women led RE enterprise models in their region.

Chapter 5

A Step-by-step Guide to Setting Up an 'RE as Enterprise' Business

Step 1: Identification of Suitable Areas

The selection of a relevant rural area or community is the first step in the enterprise development process and is influenced by a number of factors including the income level, gender inequality, and social setting present in the area. This can be achieved through gauging the economic status of the region as well as the willingness of community members to support women entrepreneurs.

Identifying areas with conducive conditions is a crucial first step and getting it right ensures a smooth implementation process. This can be achieved by using the following checklist of considerations that can help ensure the most suitable locations are identified for the project:

- Regional ranking that **shows high levels of poverty** and **low levels of women's economic empowerment** (WEE)
- **Proactiveness, basic education,** skills and business acumen of community members
- Presence of **progressive women groups** with **business acumen**

Photo: UN Environment Programme /Prashanthi Subramaniam

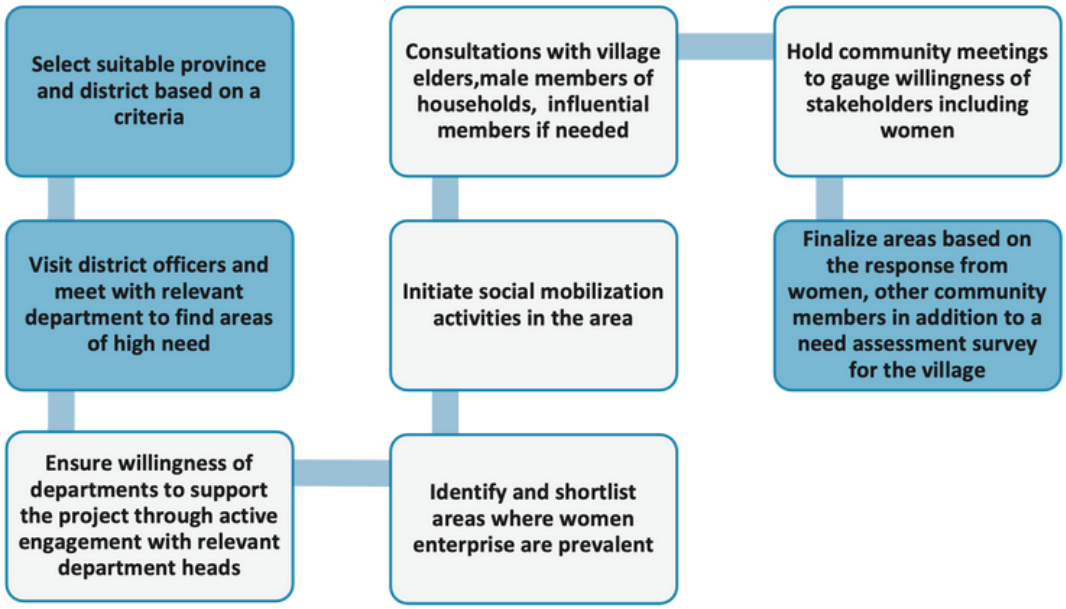
- **Willingness of community members (especially men)** to embrace a women economic livelihood project that provides energy access to the community
- **Predominance of women in some value chains** which offer high potential gains from energy interventions
- **Past experience** of women-based enterprises or similar successful energy-based businesses in the community
- **Existing financing schemes** in the region for women entrepreneurship and presence of micro-finance institutions for access to credit
- **Social outreach** and mobility related flexibility i.e., access to primary market places and approachable road communication for women
- **Low access to energy/high adverse effects of lack of energy** on social and development fronts to enhance the impact per dollar investment
- **Proximity of households from one another,** cluster approach can be used as one rural entrepreneur can easily manage a cluster of 50 households
- **Supportive government** machinery and developmental programs i.e., government initiatives on RE and livelihood support and willingness/interest by districts and provincial governments to cooperate
- **Presence of community-based organizations (CBOs) or civil society organizations (CSOs)** like self-help groups, farmers' associations, women's groups, among others and participation of women members in these groups

Box 1. A Case Study for Solar-powered Irrigation

The Renewable Energy Empowering Women Farmers (REEWF) project is implemented by Practical Action in Southern Zimbabwe where almost half of the population depends on agriculture for livelihoods. REEWF uses stand-alone solar-powered irrigation systems to benefit 360 households, 70% of which are female-headed. The project enhances skills to increase productivity through the promotion of agroecology, access to finance, relationship-building with market players, coupled with technical components.

For more information:
https://www.energia.org/assets/2019/01/Supporting-Last-Mile-Women-Entrepreneurs.pdf

Figure 4. Flowchart for Identifying Suitable Areas



- Interest and **willingness to accept changes** and cooperate
- **Access to primary marketplaces** and approachable road communication
- **Cooperation with government** departments in the village

Figure 4 above illustrates the flowchart for Step 1: Identification of Suitable Areas. Meanwhile, the following documents may be useful references:

- Approach Paper for Scoping Study on Women's Entrepreneurship and Livelihood Generation through Renewable Energy – Cambodia and Viet Nam by UNEP (Annex 2)
- Approach Paper for Scoping Study on Women's Entrepreneurship and Livelihood Generation through Renewable Energy – Bangladesh by UNEP (Annex 3)

Step 2: Needs Assessment of Livelihoods

A scoping study has to be conducted to identify the potential livelihoods and income generating activities for women as well as to assess the potential women or groups of women who can run an enterprise based on renewable energy.

This assessment should include discussions with relevant stakeholders such as government institutions, CBOs, prominent civil society players, women's groups/collectives, non-government organizations (NGOs), traders/ intermediaries, influential members of the communities and financing institutions, both formal and informal.

This step will entail collection of information on demographics, economic conditions and social needs, livelihood

Box 2. A Case Study for Clean Cooking

The objective of the programme for women cookstove entrepreneurs involved in the Sarala Stove Project implemented by Technology Informatics Design Endeavour (TIDE) in India is to provide income generating opportunities to rural poor women through the 'Clean Cookstoves Initiative'. Women are trained as the stove builders, which gives them an alternative source of income. Some of the successful women who participated in the programme go on to become trainers and help other women gain skills in stove-building and maintenance or repair.

For more information:
https://www.developmentaid.org/api/frontend/cms/file/2020/02/women_in_energy_breaking_stereotypes_and_inspiring_change.pdf

practices, skillset and existing capacity as well as the willingness of women to run an enterprise or business, and the willingness of households and the community to support an energy-based women entrepreneurship model.

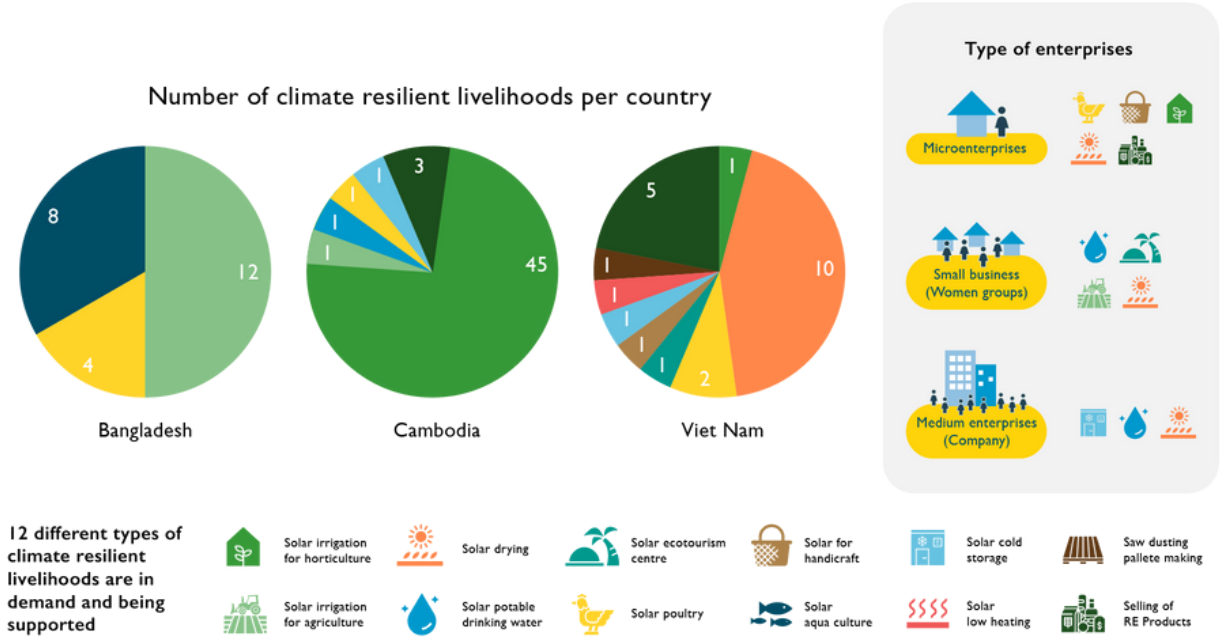
This will also help to calculate the number of households or the potential market that can be effectively targeted based on the outreach potential of the entrepreneur enabling a high-impact household per entrepreneur model that will be sustainable and scalable.

More importantly, it will result in the identification of potential livelihood options (seen in Figure 5) as well as, the potential women or groups of women who could run the business or enterprise along with an assessment of their basic skillsets and willingness to lead an RE enterprise in their community.

The needs assessment should include the following elements:

- **Demographic data** on the selected villages
- **Description of access to basic amenities** such as energy, water, sanitation etc.
- **Inventory of traditional skillset of women**, **working culture** and existing livelihood practices with **seasonal livelihood calendar** for women
- Viable **livelihood options** identified by the women in the area, acceptable by **cultural norms** (for project sustainability)
- **Existing energy scenario** in the village and potential **demand for various energy** efficient and renewable energy products

Figure 5. Types of Climate-Resilient Livelihoods Supported by EmPower



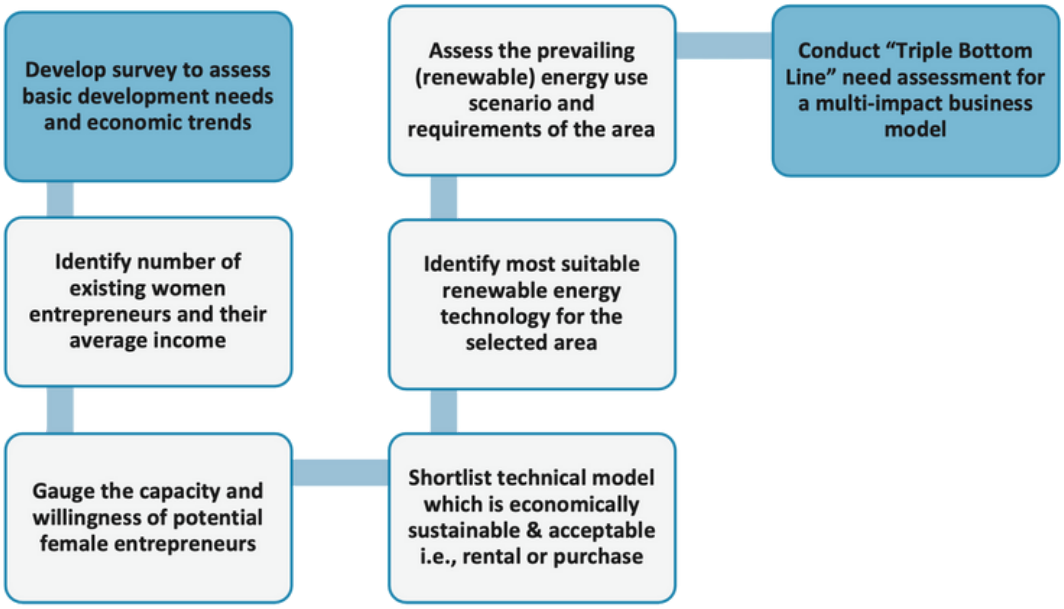
- Current **cost of using** conventional **fossil fuel-based energy alternatives** per household and the **average saving potential** of going solar
- **Income per household** and **sources of income** to identify opportunity cost of women being engaged in energy enterprise
- **Evaluation of the unpaid care work** being done by women in the household
- Residential / commercial **usage of energy** to identify tariffs or payment system linked with economic versus social gains
- Understanding of **technical competence / skillset of male** members of the communities

Figure 6 below illustrates the flowchart for Step 2: Needs Assessment of Livelihoods. Meanwhile, the following documents may be useful references:

- Pre-feasibility Study of Shortlisted Livelihood Interventions by EmPower
- Mainstreaming Gender in Energy Projects: A Practical Handbook by Energia


Photo: UN Environment Programme

Figure 6. Flowchart for Needs Assessment of Livelihoods



Step 3: Selection of a Viable Business Model

Identifying the most suitable business model for a renewable energy-based enterprise is critical given the needs, profile, and competencies of women vary across regions. Though solar energy-based enterprises are increasingly becoming more common in rural areas which lack energy owing to the abundance of solar resources in the region, some communities might be more suited to micro-hydro or biomass-based enterprises depending on their geographical terrain or prevalent resource from agriculture or livestock waste.

Similarly, the role of stakeholders including the government and community-based organization's as well as the educational and technological capacity of the targeted entrepreneurs can be crucial to the success of the projects, hence the evaluation of the same is critical to strategize and determine the most suitable working enterprise model would be for it to be "customized" for the women and the communities as a whole.

The following factors need to be incorporated when the model for rural women-based enterprise is being developed:

- **Viability of technology** in consideration of the geographical and demographic conditions of the area where RE is used as a source of energy
- **Cost structure** to create the infrastructure and service required
- **Value proposition** that solves an identified need as well as directly improves the economic condition of women and the quality of life

of their community i.e., impact on health, education, crime rates, living conditions; for renewable energy enterprise development, focus should be on articulating a clear value proposition for each customer segment, highlighting benefits of the enterprise in tackling climate change and providing the end user with a more climate-resilient option

- **Defined key activities** needed to build a sustainable business
- Outline of the **type of customer relationship** you've established or intend to establish with customers and through which touch points and channels interaction with customers will take place while delivering value
- **Detailed understanding of your customers**, specifically, all the people/organizations for whom value is being created. Ask questions such as: Who are they? Why would they buy? What is the market potential for the end product of the enterprise in the coming years?
- Identified **revenue stream** - how and through which pricing mechanisms the business captures value and how sustainability can be ensured

Figure 7 below illustrates the flowchart for Step 3. Meanwhile, the following documents may be useful references:

- Methodologies for Feasibility Studies and Financial Analysis followed by EmPower's partner, Nexus for Development
- Processes and Tools for Scoping and Feasibility Studies adopted by EmPower's partners, CHIASE and Green ID (Annex 4)

Figure 7. Flowchart for Selection of a Viable Business Model

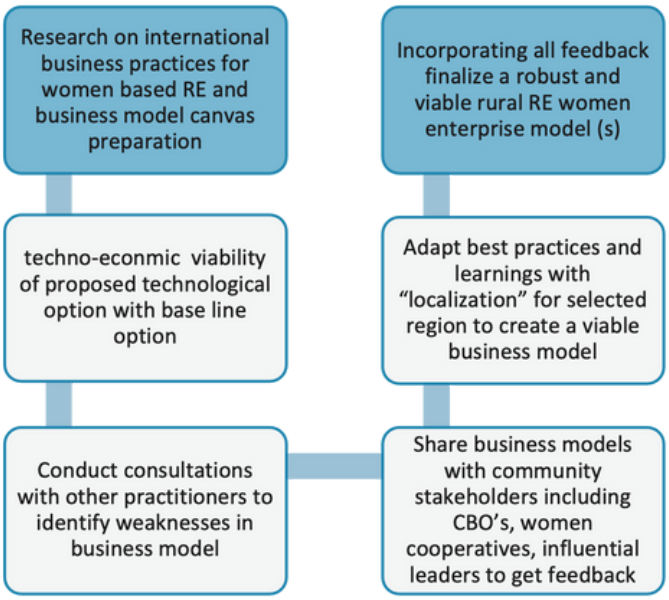


Photo: UN Environment Programme

Photo: UN Environment Programme

Step 4: Social Mobilization

Social mobilization includes the sharing of information regarding the business model and implementation plan with the local stakeholder as well as with the community via a group setting or door-to-door mobilization, depending on the socio-cultural norms of the communities. It is essential to identify different groups within the area including community cooperatives, Women's Union, other male and female associations, farmer groups, etc. and ensure that all of them are taken on aboard before initiating the projects to minimize risks and barriers that most women enterprise projects face in conservative rural communities.

Box 3. A Case Study for Promoting Women-led RE Enterprises

The Centre for Rural Technology in Nepal, Practical Action Consulting, and Energia have been involved in Promoting Women-led Enterprises for Energy Access and Local Production. The project is aimed at serving consumers in rural areas through the distribution of Improved Cook Stoves (ICS) while promoting women-led energy enterprises. This included the selection of enterprise systems and entrepreneurs, capacity building of entrepreneurs, and the preparation of business plans and market mapping for each enterprise.

For more information:
https://swnepal.com.np/project/final-evaluation-study-of-promoting-women-led-enterprises-for-energy-access-and-local-production-wee-nepal/

The willingness and support of village elders and male groups in rural settings is a prerequisite to work on women-based projects in a number of cultures. This results in having the need to ensure that the following steps are completed for maximizing ownership of the communi-

ties and ensuring their support towards the project:

- **Inform the local stakeholders and the community** about the women entrepreneurship project, and its **background** or **reasons for implementation**
- **Brief** the stakeholders and community **on the selected renewable energy business model** and consider their apprehensions
- **Educate the community** about the **enterprises**, type of **products and services** to be made available and their uses - technical details and information on procurement and supply chain to be tackled, if applicable
- Hold a **community session** on the **capacity-building of women** that provides details on the trainers (women) and the benefits of the proposed trainings, especially if men and boys are engaged to ensure complete support of the families involved
- **Brief** the community on the **economic and social benefits** i.e., the increase in women's income will lead to better quality of life for the household
- Gain complete **ownership, loyalty and trust of the community** through informative sessions, incorporating their feedback and ensuring their questions are answered
- **Train social mobilization officers** to ensure they make the community members, especially men, comfortable with their body language
- **Use local language** in social mobilization and all related materials

Box 4.1. A Case Study for Off-grid Solar

The Solar Photovoltaic Mini-Grid Installation in Jharkand, India was a project of PRADAN, Gram Oorja that greatly benefitted from the creation of women's Self-Help Groups (SHGs). Members of the SHGs were trained in solar energy setup, exposing the women to the trade and leading to the enhancement of their confidence, capabilities, and reputation as skilled workers in this field.

For more information:
https://www.developmentaid.org/api/frontend/cms/file/2020/02/women_in_energy_breaking_stereotypes_and_inspiring_change.pdf

- **Develop visually appealing and simple** to comprehend yet informative **technical and non-technical materials** for sharing with communities i.e., brochures of products, dos and don'ts cards, posters on the benefits of the technology, etc.

Figure 8 below illustrates the flowchart for Step 4: Social Mobilization . Meanwhile, the following documents may be useful references:

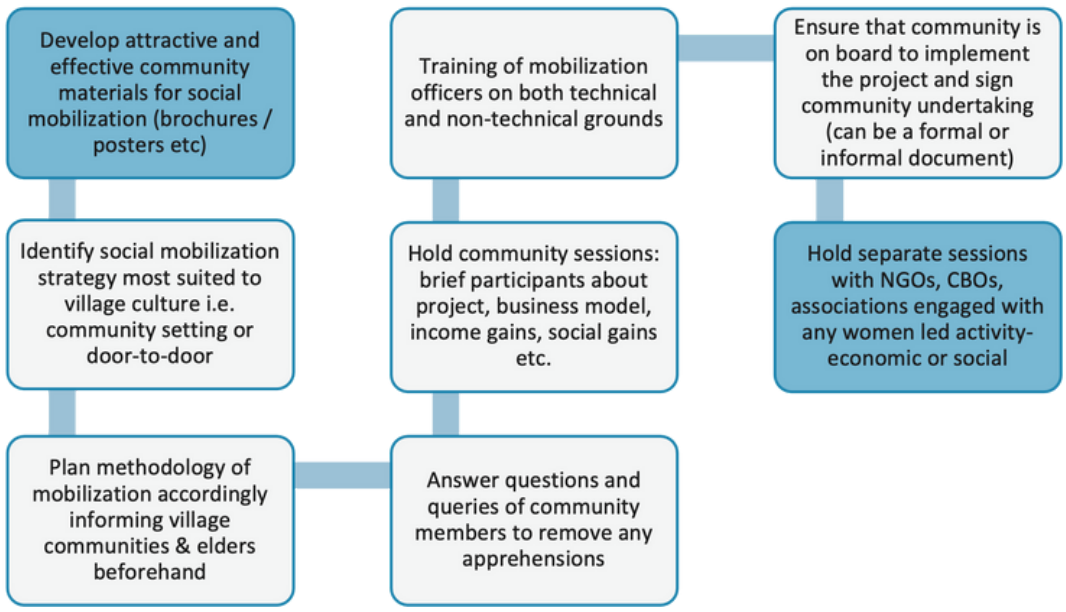
- Buksh Foundation Lighting a Million Lives (LAML) Project: 'Product Details Brochure'
- Buksh Foundation Lighting a Million Lives (LAML) Project: 'DOs and DONTS card'
- Buksh Foundation Lighting a Million Lives (LAML) Project: 'Technical Design Poster'

Box 4.2. A Case Study for Last Mile Technologies

Kopernik is a non-profit organization headquartered in Indonesia that finds what works to reduce poverty in the last mile technologies promoted under the theme of WEE. Through women's entrepreneurship, projects such as the Wonder Women Programme allow for the introduction of ICSs, solar lights (lanterns and home systems), and water filters in households.

For more information:
https://www.kopernik.info/

Figure 8. Flowchart for Social Mobilization



Box 5. A Case Study for a Green Energy Revolution Powered by Women's Enterprise

Solar Sister is a social enterprise supported by Energia set to eradicate energy poverty by empowering women with economic opportunity. Solar Sister provides women not only with economic opportunities but training and support as well in order for them to distribute clean energy that cater to underserved communities in Africa.

For more information:
www.solarsister.org

Step 5: Identification and Selection of Female Entrepreneurs

While potential women entrepreneurs are identified during the scoping and needs assessment stage, and those women are involved in business model development, the final selection of women entrepreneurs is done at this stage. This is an essential step because the survival of the enterprise depends on their ability and willingness to become agents of change in their respective communities.

Community meetings can be used to create project awareness, which will help in finalizing the list of women interested in running RE-based enterprises and willing to take up leadership roles. Those who voluntarily step up and show continued interest will then be trained through a holistic "Community Champion Model" that covers technical and non-technical aspects of the RE business.

Some criteria to consider when selecting the community-based women champions/entrepreneurs are as follows:

- Women who are **proactive, possess basic skills/business acumen** and understanding of the business
- Women who are **eager to learn** and voluntarily step up or show curiosity during the community mobilization sessions
- Women who are **willing to commit** and driven to become rural energy entrepreneurs
- Preferably, women who are **members of existing women's groups** and well connected in the communities to minimize risks
- Women with **social/community service experience** or have worked in any type of enterprise
- Women who are **endorsed by community-based organizations** and micro-finance institutions as potential leaders

- Women who are **social/ economic/environmental champions** of their communities and have a sound reputation

- **High-potential candidates** who lack traditional business experience but have skillfully managed other creative projects or family responsibilities

- Preferably, women from **marginalized groups** as their commitment to creating positive change is usually stronger e.g., widows, divorced women, physically disabled women (with a disability not affecting the entrepreneurship model)

- With a psychological assessment using a psychometric tool that indicates the women **can operate under pressure,** as in conservative communities, since they may face unpleasant situations and resistance from men

- Women with supportive male household members who are willing to support their entrepreneurship journey by filling a supporting role such as being technical agents for monitoring/ aftersales of technical equipment

Figure 9 below illustrates the flowchart for Step 5: Identification and Selection of Female Entrepreneurs. Meanwhile, the following documents may be useful references:

- Buksh Foundation's LAML Project: 'Technical Training Module for Female Entrepreneur'
- EmPower's Shortlisting Criteria for Selecting the RE-based Enterprise and Entrepreneurial Women Group (Annex 5)

Figure 9. Flowchart for Identifying and Selecting Female Entrepreneurs

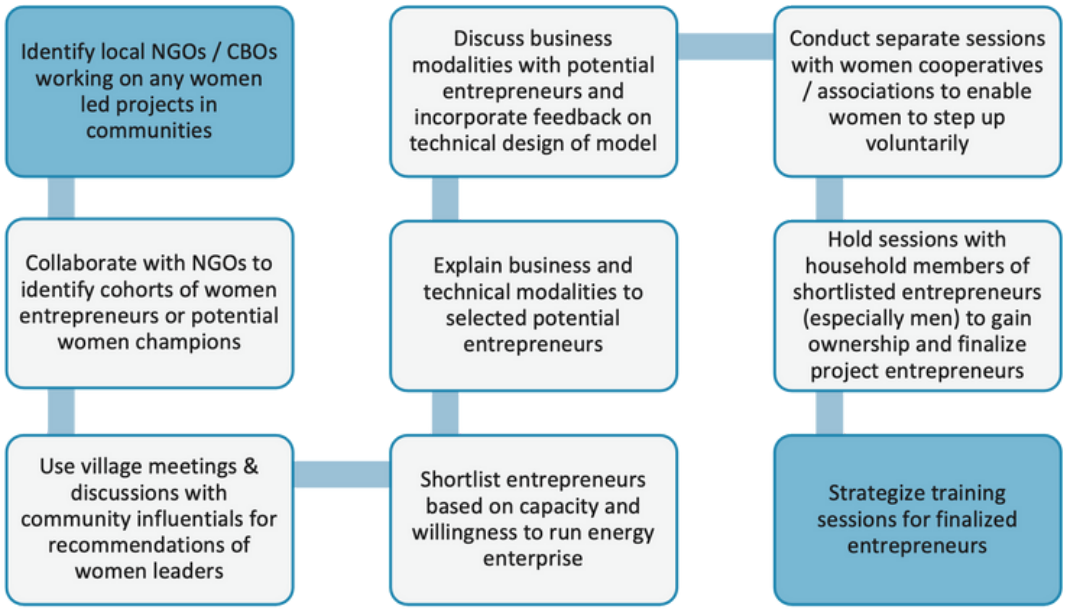
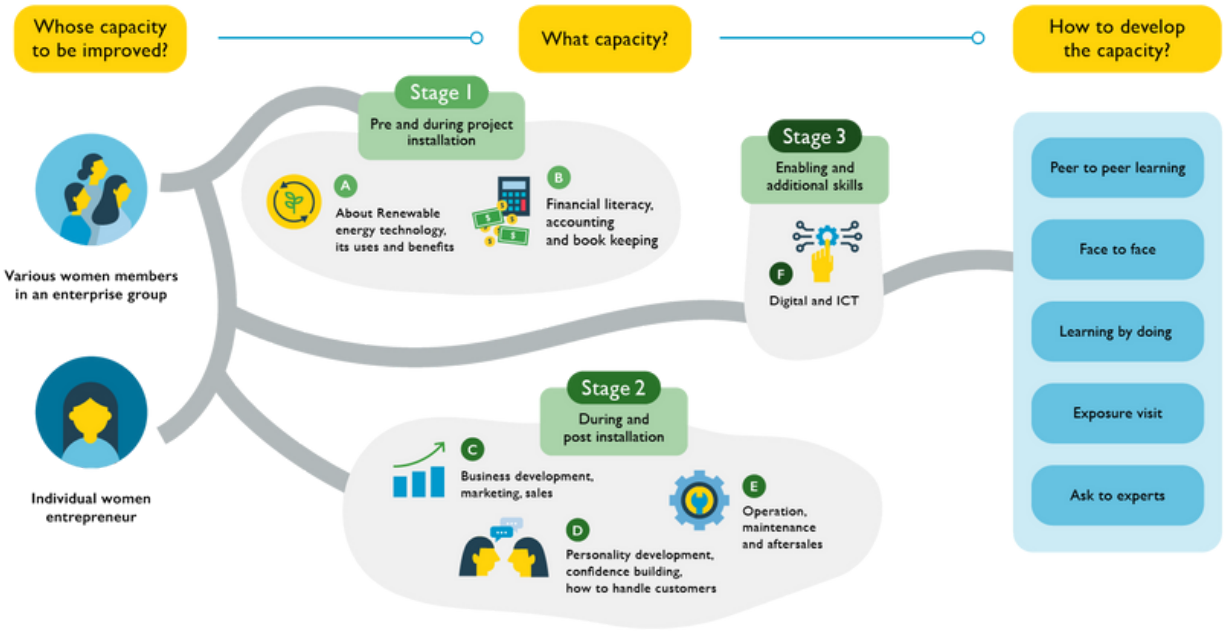


Figure 10. Capacity-building model of EmPower



Step 6: Enterprise Training - Technical and Non-Technical

Robust training encompassing technical, managerial, and operational aspects of the business as well as follow-up refresher courses are critical in developing the competencies of the selected entrepreneurs and ensuring the sustainability of the project. A holistic training and skill development approach was adopted by the EmPower project and is illustrated in Figure 10 above.

Trainings for renewable energy-based enterprises can be divided into technical and non-technical aspects as it requires both an understanding of the technology/technical product as well as basic business acumen for managing the income stream smoothly.

Also, considering the project aims to incentivize change in the communities by motivating female entrepreneurs to step up, another critical element of the trainings is on personality development


Photo: UN Environment Programme

so that the women entrepreneurs are self-confident, can handle pressure, are able to tackle stressful situations, and can innovate or think out of the box, among other things. Some of these key components to be covered in the community trainings are enumerated in Table 2 below.

This stage also includes the selection of trainers which plays a key role in the effectiveness of trainings. Recruiting trainers who speak the local language and can communicate effectively can help ensure that entrepreneurs have a strong understanding of the product and services, as well as how they can best communicate with their customer base.

For training sessions to be effective, which means the women entrepreneurs become fully equipped with technical, non-technical, and interpersonal skills, the following conditions need to be considered during the Training of Trainers (TOT):

- Adequate investment in building the **women entrepreneurs' self-confidence** since courage is required to step out of one's comfort zone and discover inner strengths
- High engagement and **active participation** of women entrepreneurs in **interactive and varied sessions** so they get more out of the training especially as they hear about the experience of their peers
- **High comfort level and feeling of connectedness** among women entrepreneurs established and complemented by a high comfort level with the male members of the community

Table 2. Topics for Enterprise Training

TECHNICAL	NON-TECHNICAL
Technical knowledge of product	Enterprise registration process (if needed)
Operational details i.e., day to day product usage	Basic business and accounting skills including book-keeping, budgeting and managing savings
Maintenance and After Sales	Purchase and inventory management
Environmental benefits of the product	Self-confidence / self-image development including stress management
Awareness of renewable energy at large	Communication and interpersonal skills
Economic benefits of the product especially in comparison to conventional fossil fuels	Leadership and agency
Sales and marketing	Innovation and creative thinking/problem-solving

- **Use of visuals** that reduces dependency on written words i.e., use of pictures, slide shows, charts, games, role-playing, open discussion, break-out groups and practical work which facilitates learning-by-doing

Photo: UN Environment Programme

Photo: UN Environment Programme

- Selection of **accessible and socially acceptable training venues** which are easy to reach, safe, can be used free of charge, and ideally centrally located in reference to the locations of the communities involved
- **Strategic scheduling** of trainings must be done, avoiding sowing and harvesting seasons in rural areas since women are most likely burdened with both unpaid care work and field work at this time
- **Duration of training** (i.e., number of hours each day, number of gatherings, etc.) established **based the availability of the participants** and is flexible enough so that the training schedule works well for most entrepreneurs
- Training material and sessions **delivered in local language** with the trainers consciously working on their body language to ensure

Box 6.1. A Case Study for Supporting Last Mile Women Energy Entrepreneurs

A project implemented by ENERGIA supported more than 4,000 women to launch and grow clean energy businesses in seven countries. These women-led, largely microlevel, enterprises have delivered clean energy products and services to more than 2.9 million consumers, mostly in rural areas and in low-income communities.

For more information:
https://www.energia.org/assets/2019/01/Supporting-Last-Mile-Women-Entrepreneurs.pdf

that the women entrepreneurs are comfortable

- Ideal **training group size achieved** which is around **15 to 25 participants** (not more than 25) and includes men from the community to get buy-in from start of the project

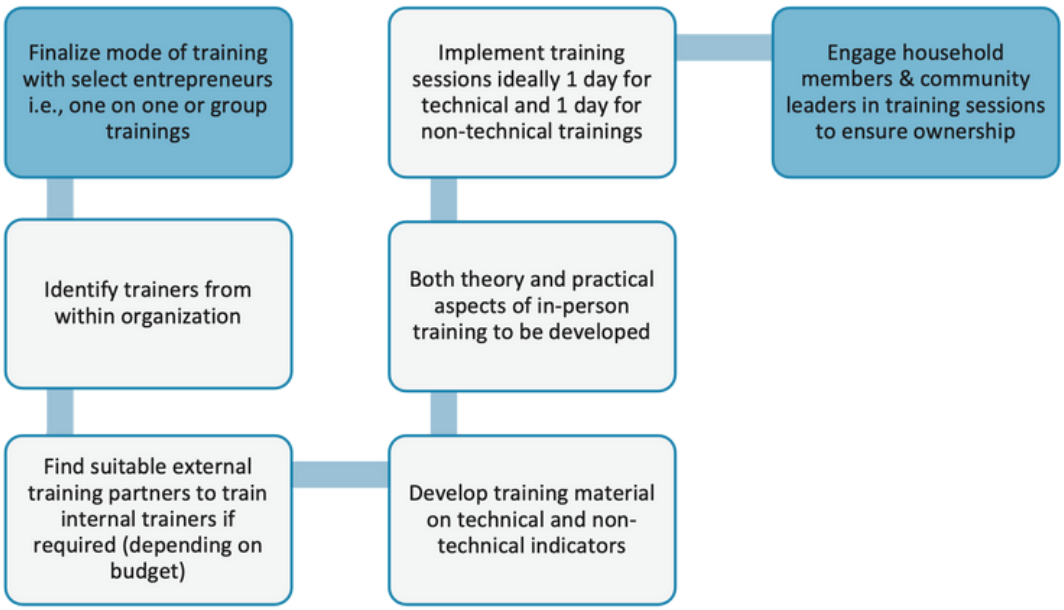
- **Engagement of local community leaders** in the training sessions as they play a crucial role in supporting the entrepreneurs and linking them with ongoing initiatives and possible financing sources

- Involvement of **trainers who speak the local language/ dialect** - the training component can be outsourced to an organization that specializes in capacity-building (the use of third-party training experts is recommended) because they can apply different training methods and make the trainees feel more comfortable speaking in their own dialect

Figure 11 below illustrates the flowchart for Step 6: Enterprise Training. Meanwhile, the following documents may be useful references:

- Buksh Foundation LAML Project: 'Technical Training Module for Female Entrepreneur'
- Buksh Foundation LAML Project: 'Technical Training Module for Field Technician'

Figure 11. Flowchart for Enterprise Training



Step 7: Establishing the Technical Infrastructure

Technical infrastructure is an essential part of setting up energy enterprises. The sustainability and resilience of the entire project depends on this core component. With a variety of products available that can be used in renewable energy-based models, selecting high quality products with international certifications is critical for success.

The International Finance Cooperation (IFC) has stringent quality controls reflected in its "Lighting Asia" certifications, which approves only select vendors for solar off-grid lighting markets. Thus, this certification can be a useful guide in vendor selection.

Ensuring that the technical model is sound and verified by expert technical engineers an important determinant in establishing the viability of applying a specific type of technology in a contextualized setting such as rural areas. This in turn increases the likelihood of success and builds the confidence of the communities in the selected technical enterprise model.

Technical solutions can be anything from the one-on-one sale of solar lanterns or installation of solar home solutions to the setting up of mini hydro plants to power homes or biomass projects. After choosing the technology that is best suited for the community based on findings of the needs assessment, it would be ideal to check whether it has demonstrated success in similar geographies.

Box 7. A Case Study for Women-led Clean Energy Enterprises in Pakistan

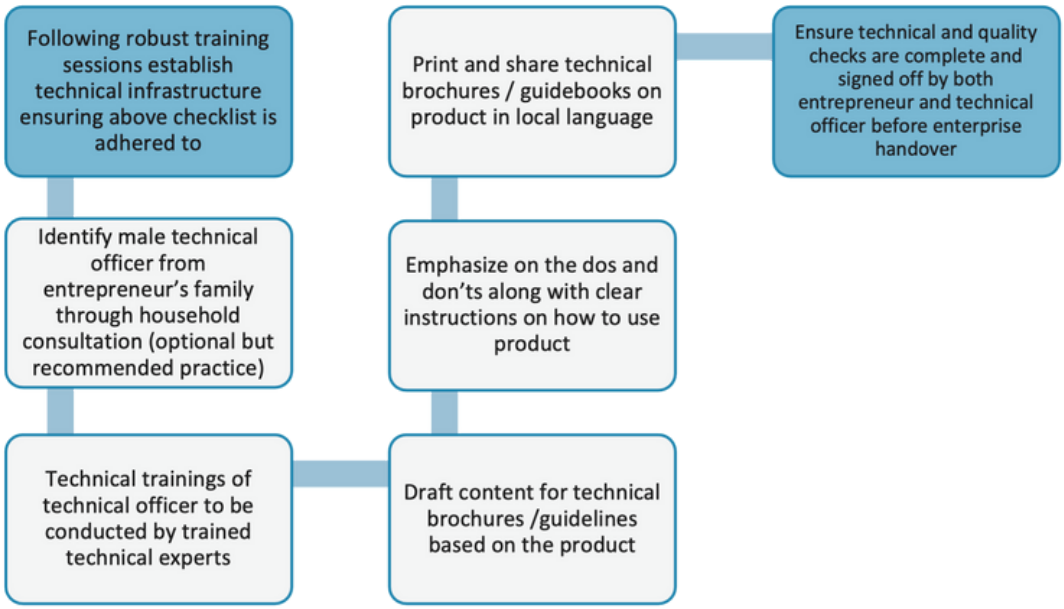
The Lighting a Million Lives (LAML) project of the Buksh Foundation in Pakistan has been supporting women in un-electrified rural areas so they can launch clean energy enterprises by setting up solar charging stations. The stations were run by selected women from the villages, where they were in charge of renting out and selling equipment.

For more information:
https://www.phoneworld.com.pk/ufone-and-buksh-foundation-starts-lighting-a-million-lives-campaign/

An expert technical team is required, either internally from the organization or outsourced from a third party, for the design, engineering, and installation of the technical infrastructure. Some key ideas to keep in mind regarding the set up of the enterprise's technical infrastructure are as follows:

- **Quality assurance** of products through **international standards**
- Established **successful prior use** of the product in similar projects
- Level of ease for **after sales and maintenance**

Figure 12. Flowchart for Establishing the Technical Infrastructure



- **Awareness** of the community about **technical specifications and usage of product**
- Proper **training on technical infrastructure** with do's and don'ts for maintenance of the product
- **Cleaning and repair schedules** to be placed on the walls of the enterprise
- **Male members** from the family of the entrepreneur can be selected as **"technical officers"** for the enterprise
- **Technical officers can be trained** by expert technical teams on various aspects including, repair and maintenance of technical infrastructure
- Established **dual benefit of male technical officers from the family** i.e., increased ownership of male members, additional income stream as technical officers, opportunity to perform other small technical jobs in nearby communities
- **Detailed technical guidebooks provided** to both the **female entrepreneurs** and technical officer in local, easy to understand language detailing technical specifications and repair/maintenance guidelines

For a visual summary of all the processes involved in Step 7: Establishing the Technical Infrastructure, refer to Figure 12 above.

Box 8. A Case Study for Energy Creating Social Impact in Senegal

Energy 4 Impact works with women's groups, who are being supported to become energy entrepreneurs. The Energy Opportunities for Women in Senegal (EOWS) project has explored several arrangements for women entrepreneurs to work with energy equipment suppliers and find ways for them to market and sell their products as agents. Some women have also been engaged as sales agents for solar lamps.

For more information:
www.energy4impact.org

Step 8: Marketing, Sales, and Product Promotion

Marketing and promotion techniques are essential to ensure that the targeted clients of the enterprise are aware of the availability, use, and benefits of the product. Given the usual reluctance to adopt renewable energy through new products in a number of conservative rural areas, marketing the enterprise in a simple yet attractive way can play a key role in attracting customers at the initial stages of the project, before confidence in the technology is established.

Given the strong links and relationships that exist within rural communities, customers benefitting from the product at the onset can help to increase sales over a short period of time through "word of mouth." In addition to this, several other marketing principles/techniques can be applied:

- The use of the **Five W's** of marketing (i.e., Who, What, When, Where, and Why) or of the **Seven P's** (i.e., Product, Price, Promotion, Place, People, Process, and Physical Evidence) can complement the overall marketing strategy within the rural scenario
- **Awareness campaigns** need to be developed based on the assessed level of understanding of the communities involved to provide information not only about the specific RE product or enterprise but also the renewable energy technology utilized
- The use of **promotional items** such as shirts, backpacks, and marketing materials with clear branding can make the RE enterprise more visible, desirable, and distinct from other enterprises
- Creating a **tagline and brand identity** for the enterprise that resonates with the entrepreneurs can help instill confidence in the brand and solidify the women's relationship with it so that they become brand ambassadors while serving as agents of change in their communities (i.e., Wonder Women, Light Lady, Roshni Bibi)

- **Entrepreneurs can be trained** on how to conduct technology fairs, community awareness events, door-to-door marketing, community mobilization, etc. to **improve the reach of their products and offerings**

- **Delivery and trial of the product by village influencers** such as the eldest member of the community who is usually the most respected or other community members who everyone else looks up to socially can increase product uptake

- **Online sales and marketing** through digital partnerships - the provision of smart phones/ tablets to entrepreneurs can assist in this process

- **Promotion and marketing** of the project **amongst its donor network** by telling 'success stories' can help people see the benefits of the product or enterprise and build support (i.e., production of documentaries, release of publications, staging awareness events with a 'meet and greet' with the entrepreneurs themselves)

- The **use of social media** to market the project and amplify the reach of promotional materials can raise awareness about the project and build brand identity, especially with potential donors

- **Creation of a product template** based on the project after its successful implementation

Whether the purpose is to scale up the project or allow others to be able to attract investors for similar projects, a product template can prove very useful.

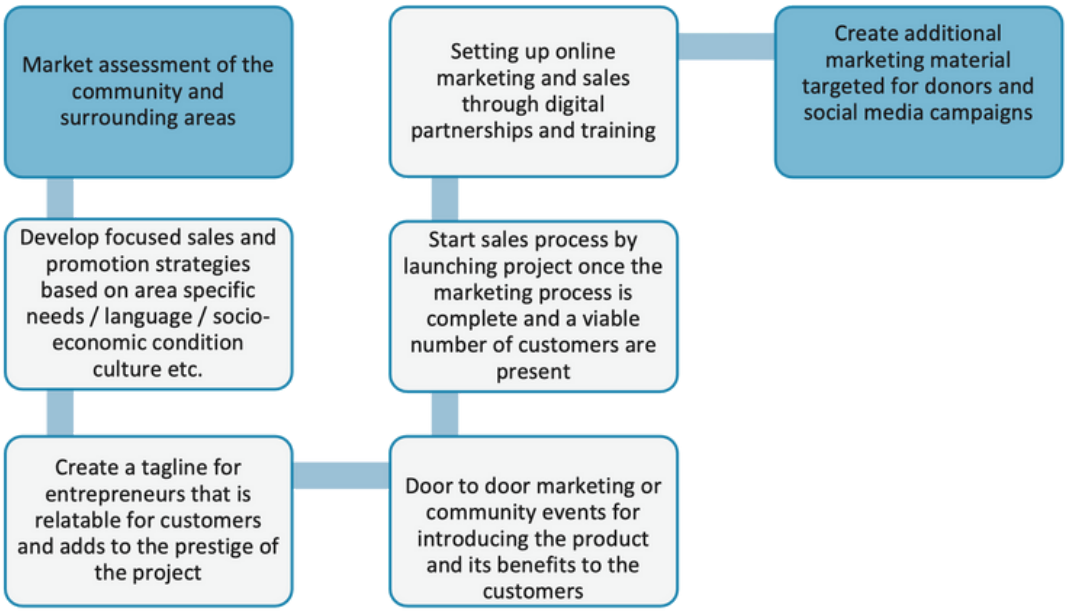
For example, in the case of "Lighting a Million Lives", one village comprising of fifty households would require funding one female entrepreneur's complete technical infrastructure setup i.e., a Solar Charging Station (SHS) which charges fifty solar lanterns and a solar mobile charging station. The funding required considers expenses for the technical and non-technical trainings to be provided to the women entrepreneurs and the technical officers as well as, community mobilization and awareness campaigns. The total amount can then be offered to a donor in the form of a $5,000 ticket size which makes it easier to scale the project and enables multiple development and private sector donors to fund the project.

For a visual summary of all the processes involved in Step 8: Marketing, Sales, and Product Promotion, refer to Figure 13.

Step 9: After Sales and Maintenance Services for Project Sustainability

The quality of after sales services and the ability to inculcate more technology throughout the delivery process, is essential for smooth operations and can ensure the sustainability of the RE-based business models in rural communities.

Figure 13. Flowchart for Marketing, Sales, and Product Promotion



Products/technical infrastructure that requires minimum after sales services and maintenance should be offered to relieve them from the burden of having to continuously perform repairs and/or upgrades. To facilitate this, the following should be done:

- **Teach entrepreneurs to save** a percentage of profit **and reinvest in the business** for long term growth creating an "After Sales Kit" for the entrepreneur
- Given the context of the COVID-19 pandemic, **focus on business sustainability especially amidst crises** and introduce savings into the business model
- **Train household members** of the women entrepreneurs so they gain the **technical skills** needed to assist with the delivery of maintenance/after sales services such as regular cleaning of solar equipment, replacement of parts, etc. In particular, training male household members on the technical aspects of the product/ technology not only allows them to generate additional income from servicing neighboring villages but also fosters ownership and acceptance of the enterprise
- **Incorporate Information and Communication Technology** (ICT) in marketing and sales which enables the entrepreneurs to expand their market size and generate higher profits - ICT can increase access to markets, supply chains, and financing i.e., users can send/receive money via mobile phones, which reduces transactional costs and promotes digital empowerment

- **Use technology to cater to vulnerable groups** i.e., the use of mobile phones to conduct business transactions allows women with limited physical mobility to easily communicate with suppliers and customers while reducing the need to travel

- **Maximize the benefits of digital connectivity in the organization of trainings** as experienced trainers in urban centers can connect directly to multiple rural settings (where groups of women can be reached), allowing them to perform high-quality trainings at reduced costs

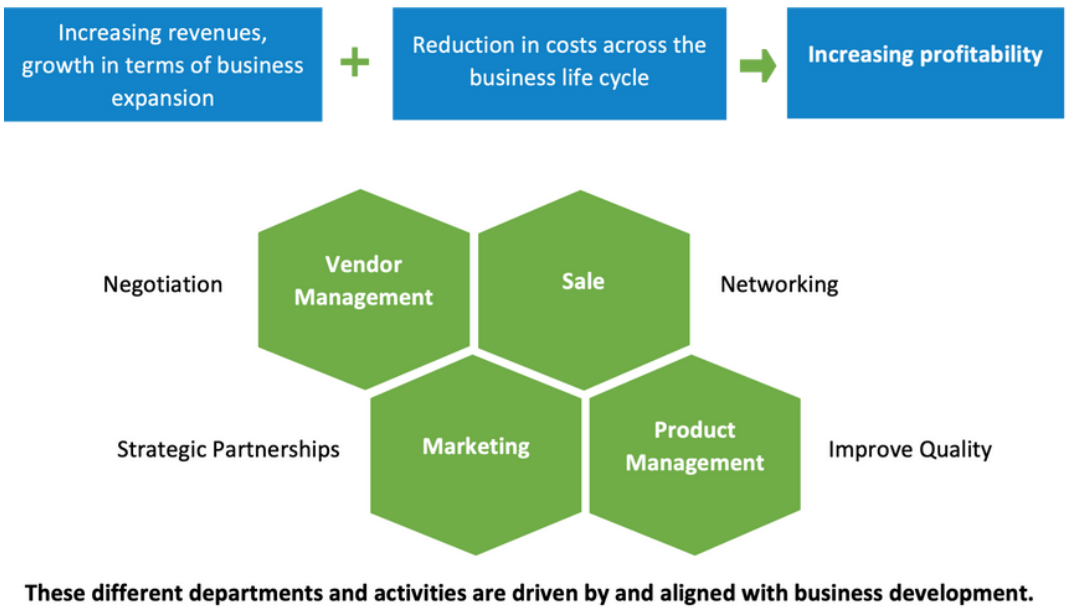
- Try to **generate support from telecommuication providers** as they can provide grants to fund the use of ICT in rural energy enterprise models as part of their Corporate Social Responsibility (CSR) programmes

Box 9. A Case Study for Empowering Women with Solar Kiosks & Digital Tools

Benoo has been supporting the development of female entrepreneurship in the energy sector of Togo in Africa. The business model is structured around the provision of: a) a leased stand-alone solar generation and storage system and set of efficient equipment to incentivize productive and commercial uses of energy; and b) a digital platform to support the entrepreneurs' sales, logistics and financing needs.

For more information:
www.benoo.africa

Figure 14. Factors to Consider for Business Growth



When it comes to creating business development plans, especially those targeting growth, apart from the considerations discussed in Steps 8 and 9, factors reflected in Figure 14 should also be taken into account. Meanwhile Figure 15 below illustrates the flowchart for Step 9: After Sales and Maintenance Services for Project Sustainability.

Strategic vendor management, sales, marketing, and product management are vital elements of running any enterprise so entrepreneurs need to include plans related to these aspects to ensure long-term profitability.

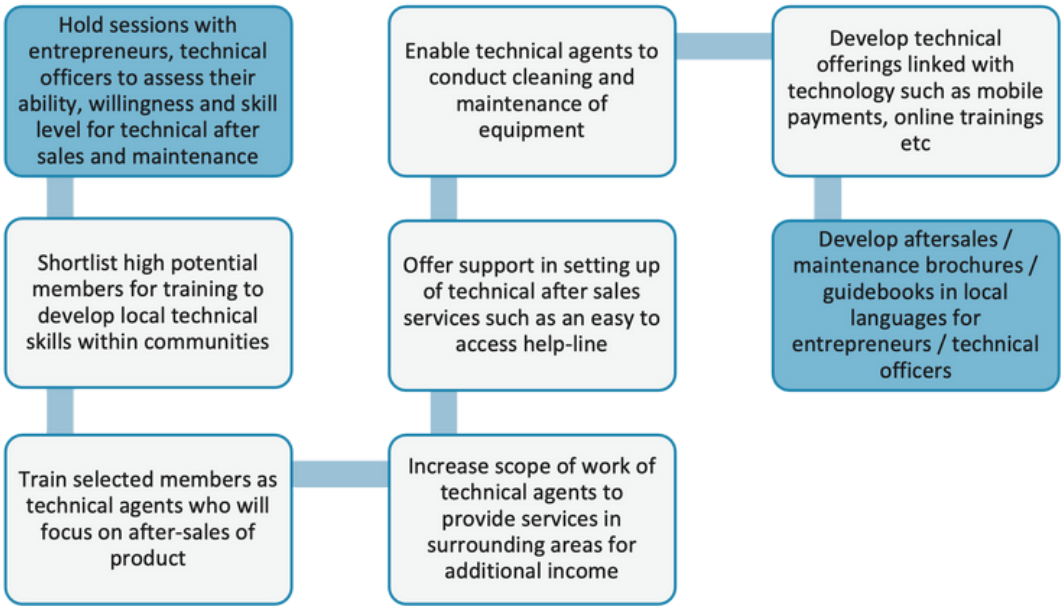
Step 10: Project Advocacy, Branding and Collaborations

Advocacy and branding are essential to get the project scaled up once the renewable energy infrastructure and enterprise model have been established and proven to be sustainable and scalable. It is essential to ensure a sound technical pilot is first undertaken with results calculated and an "Impact Assessment Report" developed, which can then be marketed and showcased to potential donors, paving the way for successful collaboration and fundraising.

To develop a focused advocacy strategy, stakeholders who can be potential investors and donors of the project need to be identified then the following must be undertaken:

- **Gather information about the potential partners** and which organizations are interested in replicating the project; identify experts, activists, community leaders and their attributes

Figure 15. Flowchart for After Sales and Maintenance Services for Project Sustainability



- **Use Market Facilitation Organizations (MFOs)** that support the growth of renewable energy markets and enterprises through a combination of networking, user education, market research, partner matching, and business-deal identification and facilitation

- **Develop clear messages** and transform impact data and information into a form that audiences can relate to; if quantitative data is unavailable for measuring the outcomes and impact, **use evidence** presented in media reports and available process documentation

- Ensure the **impact assessment reports share tangible social, environmental, and economic impacts** of the project for the women entrepreneurs, the technical officers as well as the communities

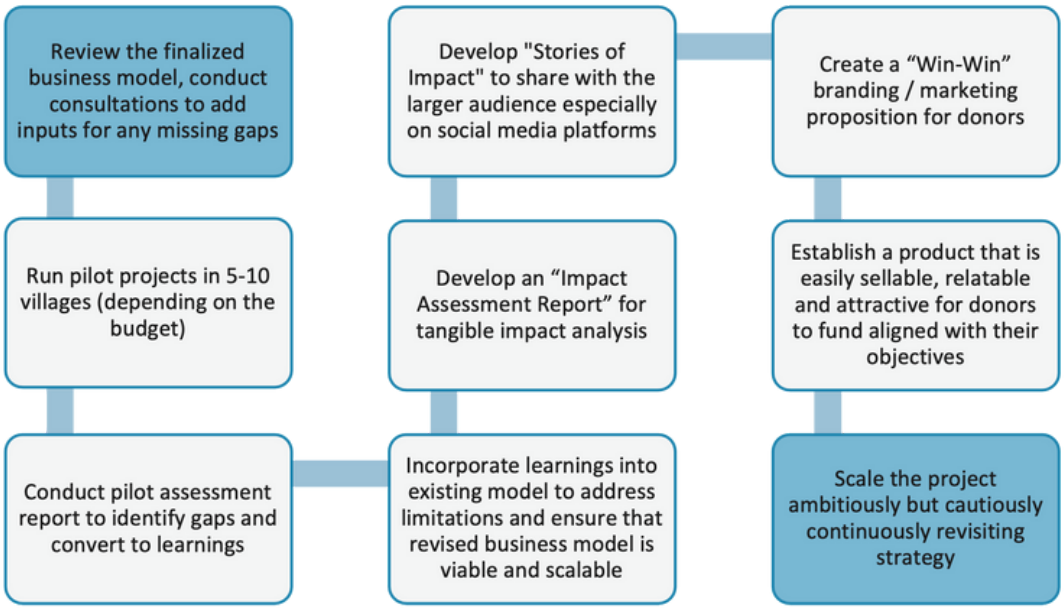
- **Share stories of impact on social media** to create greater awareness of the project and the impact it has had on the lives of women, their households, and the community at large

- **Enhance the project's funding streams** without sole reliance on donor funds, exploring other private sector grant options by tapping into CSR funds of multinational corporations, philanthropists, etc.

Figure 16 below illustrates the flowchart for Step 10: Project Advocacy, Branding and Collaborations. Meanwhile, the following document may be a useful reference:

- Buksh Foundation's LAML Project: 'Triple Bottom Line - Impact Assessment Report'

Figure 16. Flowchart for Project Advocacy, Branding and Collaborations



Chapter 6

Methodology for Setting Up an 'RE for Enterprise' Business


Photo: UN Environment Programme

This section will focus on the use of renewable energy resources to setup and power enterprises led by women in rural areas. A number of initiatives around the world including the EmPower programme, have successfully utilized RE sources for economic livelihood activities in rural areas. These include agriculture, poultry farming, aquaculture and cold storage amongst others.

Most of these enterprises, particularly those implemented in the EmPower programme countries, are based on solar energy because of several factors that include the following: an abundance of the natural resource, ease of technical setup, minimal after sales service/ maintenance required, the demonstrated success of the technology, and the presence of a wide range of quality suppliers.

Suitable Business Model

The selection of a business model that is conducive to the environment and economy of the region is the first step in this process. To ensure that a suitable business model is selected, pre-feasibility and feasibility studies should be conducted. A business model canvas (i.e. the nine "building blocks" of the business model design template) can be

used and proper consultations done for each potential business idea. A SWOT analysis should also be accomplished along with a thorough investigation of a business model's sustainability and scalability.

The output of these activities must be validated. Then a shortlist of business models and business plans for various RE-based enterprises can be produced before women/groups of women are identified to potentially run the businesses.

Selection of Technology

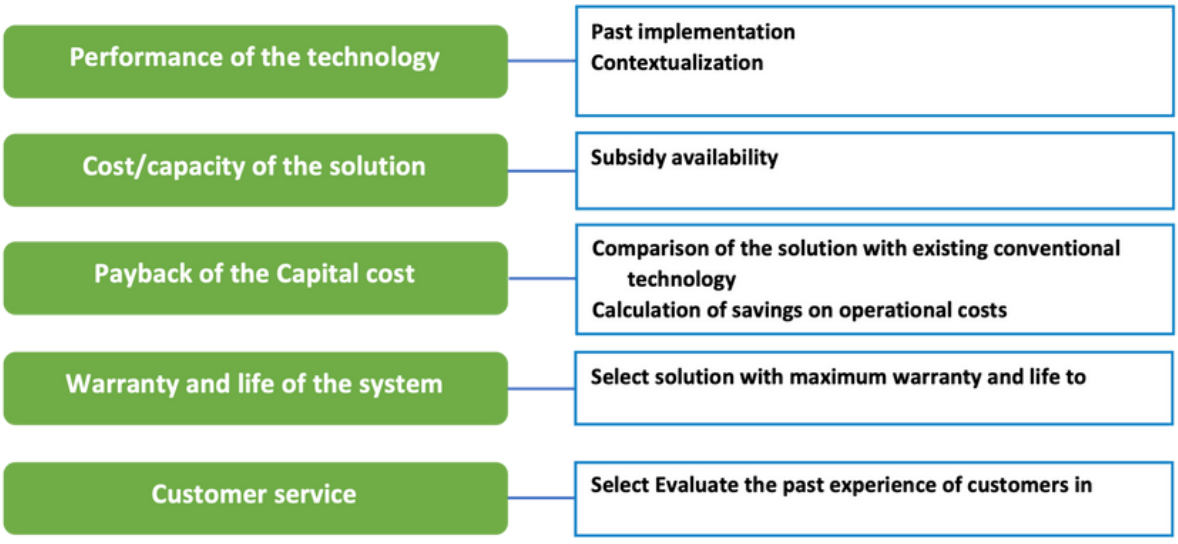
The selection of a suitable RE technology is one of the most important tasks under the business model development stage. The selection of RE technology should involve the following:

- Energy needs assessment for the enterprise
- Renewable energy resource assessment
- Cost-benefit analysis on the use of a specific RE technology
- Evaluation of performance of the proposed solution with baseline information

Selection of RE Supplier

The selection of a suitable RE supplier is a critical step and needs to be completed after a thorough review of all the potential suppliers available in the region. The factors that need to be considered include supplier's history in terms of previous projects, quality of products delivered, the certifications achieved, and after sales services offered such as maintenance and repair. Figure 17 below summarizes these aspects in more detail.

Figure 17. Factors to Consider in Selecting an RE Supplier



Supporting Factors

In setting up an 'RE for Enterprise' business, the following activities should be carried out:

- **Identification of key partners** who should be involved including government entities that can help leverage your business model if there is a lack of resources that prevents the implementing organization from performing all the key activities on their own
- **Identification of key resources** required such as the infra-structure needed to create, deliver, and capture value as well as indispensable assets including training of the women (and men) to become sustainable economic agents and entrepreneurs
- **Marketing and promotion of the RE-based enterprise,** which can play a key role in supporting the growth of the business in the area

Given the advantages of RE and the growing awareness around it, businesses based on or run from solar and other RE technologies have the opportunity to generate higher sales and achieve greater profitability. This increases the importance of marketing and promotions that can highlight the value of the product and the environmentally friendly RE technology used to produce it.

Figure 18 below lists the important factors discussed above which in turn determine the setup of RE-based enterprises. Meanwhile Figure 18 summarizes the necessary steps and activities that need to be undertaken to establish an 'RE for Enterprise' business.

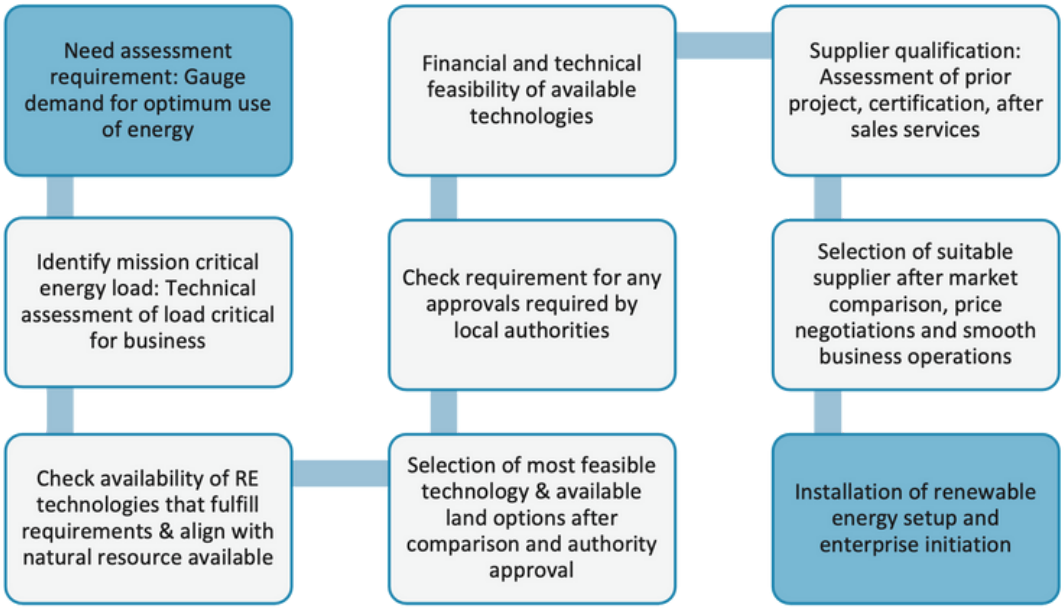
Figure 18. Factors to Consider in the Set-up of Enterprises Powered by RE

Box 10. A Case Study for Innovative Clean Energy Finance for Cambodian Farmers

The Clean Energy Revolving Fund (CERF) helps Cambodian farmers in different segments of the agrifood sector invest in small-scale RE solutions by offering affordable finance.

For more information:
https://www.reeep.org/projects/innovative-clean-energy-finance-cambodian-farmers-nexus

Figure 19. Flowchart for the 'RE for Enterprise' Process



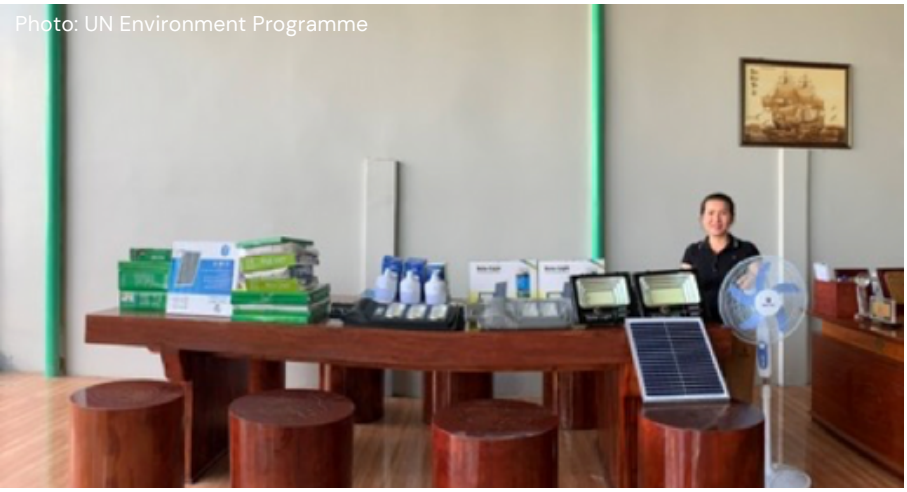


Photo: UN Environment Programme

Photo: UN Environment Programme

Chapter 7

Additional Cross-cutting Steps for Successful Business Models

Mentorship of Women Entrepreneurs

Mentoring through role modeling and showcasing best practices is a critical element of the strategy to enhance the business skills of the women entrepreneurs who usually live in remote locations. The mentor visits the mentee in order to provide specific, customized, and timely support ideally in person or through digital sessions hosted with the aid of technology since there might be limited connectivity or access to digital devices in remote villages.

The mentors can either be peri-urban/ urban female entrepreneurs in the energy sector who could inspire the rural women entrepreneurs and host an inspirational and motivational session with them, ideally in a group setting. Alternatively, the mentors could be rural women entrepreneurs who have successfully launched a renewable energy enterprise and can now inspire other women in the surrounding communities to become an agent of change as well.

The mentorship can be done either through occasional mentoring/ inspirational sessions or through a structured mentorship program that can guide the women entrepreneurs in their early years.

Photo: UN Environment Programme

For example, a 1-year mentorship program can be put in place to closely guide the women entrepreneurs until the enterprise is sustainable and the women entrepreneurs have evolved/broken through initial social and cultural roadblocks.

When setting up a mentorship program, the following should be kept in mind:

- **Mentors** must be **well-qualified, flexible**, and **able to relate** to the strengths, weaknesses, needs, and constraints of the women entrepreneurs (i.e., speak their language, understand their working environment, and able to adapt to the local culture)
- A **group mentorship approach** can be adopted when the capacity needs of the various entrepreneurs become more similar towards the end of the project and when an inspirational session needs to be held
- Mentors are encouraged to **set time-bound goals and make an action plan** of the activities that are necessary to keep the entrepreneur on track
- Mentorship is also a **useful monitoring mechanism;** mentors can be asked to submit monthly progress reports, which help the programme to track the progress of the entrepreneurs
- **Mentors** can be **identified at all levels**; other successful women entrepreneurs from within the community can serve as mentors and motivate more women to take up the journey of entrepreneurship; urban female energy entrepreneurs/practitioners who can spare some time can conduct community-level motivational sessions to help build the confidence of the new women entrepreneurs and connect them to the larger renewable energy markets

Rural Women Entrepreneurs/Energy Network (Peer Support)

The creation of peer groups within cohorts of entrepreneurs has proven to be an excellent source of knowledge sharing and support while contributing positively to the enterprise's overall development.

At the same time, it provides social cohesion and an opportunity for like-minded women to come together and share common problems to identify solutions. Furthermore, it leads to a collective agency or voice that enables rural women to stand up for their rights and create collective momentum as their projects grow. Some successful initiatives to foster the same in the targeted communities are as follows:

- Creation of a peer support system i.e., "Sisterhoods" where women entrepreneurs receive training and **connect with each other directly to exchange tips and good practices** or work together to support each other in various business activities

Box 11. A Case Study for Financial Inclusion of Women Entrepreneurs in Viet Nam

The Australian Foreign Affairs and Trade Department (DFAT) and Vietnam Bank for Social Policies (VBSP) supported a program that aims to enhance and improve the access of low-income households as well as women-run micro-enterprises to financial services. Through mobile banking, they were able to promote financial inclusion and economic empowerment of underserved populations including women entrepreneurs in Viet Nam.

For more information:
http://thebpp.com.au/wp-content/uploads/2019/01/Press-release-_Phase-Two-Launch-06.9.2019.pdf

- Fostering of good business habits through consistent **monthly engagements** with the women entrepreneurs that **introduce new skills and lessons** while also revisiting past topics and learnings from the experiences of their peers

- Building sisterhood and trust; entrepreneurs can **learn from the successes and missteps** of their fellow entrepreneurs then strategize based on their own context

- Entrepreneurs can **hire other women, friends, and relatives** to reach distant locations based on recommendations of their peers

- Entrepreneur networks for collective agency and voice; rural women can **develop a collective forum** for negotiating with suppliers and financial institutions or for creating collective awareness around scalable and replicable models

- As agents of change for their communities, the women entrepreneurs can **innovate with the project and add additional community services** with the support of other women and partners such as village health workers, village teachers, village women spokespersons, etc.

Access to Finance - Both Formal & Informal

Start-up capital for female micro-entrepreneurs engaged in sales/ distribution of energy products and services is often critical to purchase initial inventory and to ensure working capital needs are effectively met. However, women entrepreneurs often face difficulties in securing financing for projects owing to their lack of collateral or access to formal financial institutions.

Lack of access to financing becomes one of the biggest barriers towards launching and scaling up a successful women's enterprise model in rural communities. Tapping into a diverse network of donors

and the provision of aid can increase the financial capacity of the women entrepreneurs but to streamline financing for the practitioners the following must be accomplished:

- Provide **outreach, training, and education** for the women entrepreneurs to enhance their financial literacy and give them a better understanding of available financial services such as microfinance institutions, rural support networks, CBO's and other informal financial instruments commonly found in rural settings

- Enable the rural entrepreneurs to **establish credit history and become bankable** (i.e., joint bank accounts for households or separate bank accounts for women business owners)

- Provide trainings that **increase the awareness and education of staff in financial institutions,** enabling them to more effectively engage with women entrepreneurs, specifically when it comes to disseminating information to the community on new products and financial services

- Collaborate with the financial institutions that are in close proximity to the community in order to **launch specialized products that specifically cater to women entrepreneurs** and conduct 'gender sensitization' trainings for their staff to be more welcoming and supportive of women entrepreneurs

- **Modify approval and delivery process for loans** in areas where cultural norms may limit women's movement, travel, or interactions with others (i.e., use of mobile money) and establish partnerships with digital service providers in the area

- **Customize offerings for the local context** and markets especially with regard to product offerings, payment schemes, collateral requirements, etc.

- Donor funded energy-related subsidy programs working with financial institutions can help entrepreneurs to access microcredit by negotiating for **low-interest loans with longer payback periods**; they can underwrite risk for micro-entrepreneurs by providing the collateral when linking with financial institutions

- Encourage suppliers to provide inventory through a **micro-consignment model** wherein the entrepreneur pays back the inventory after making a first round of sales which creates a revolving income stream

- Establish supplier credit to allow **initial payments to be deferred** until after one month of operations, easing the burden on entrepreneurs

- **Train entrepreneurs on how to access financing, book-keeping, monitoring inflows and outflows** to ensure sustainability of the business and create a bankable business model that can be leveraged in negotiations with financial institutions

- During the initial launch of the rural energy enterprise model, **utilize grant money through a practitioners funding pool** followed by the utilization of a steady income stream and subsidized loans to add inventory and scale up the business

- The practitioners also need to focus on a **diverse pool of donors** with customized strategies for each donor sector that creates a win-win proposition for the entre-preneurs, the practitioners, and the donors

The donor pool may include but is by no means limited to the following:

- Traditional donor funding through direct donor proposals or small grant applications
- Large development projects related to access to energy by Government and bilateral institutions
- CSR funding from multinational companies and other private sector organizations
- Philanthropists' funding by sharing results of impact assessment studies
- Political campaigns since access to energy and economic livelihood development are key goals for various constituencies/communities

Conclusion

This document is an effort to share the consolidated learnings and best practices from successfully implemented projects of EmPower's partner organizations in addition to other global best practices/success stories within the realm of energy entrepreneurship for women. A wide range of actors, national and international development organizations, private sector and governments are increasingly recognizing the needs and significance of empowering women and allowing them to play a greater role in the promotion of renewable energy services particularly in rural areas. However, ensuring that the correct and most efficient process to work on these initiatives is followed is perhaps the first and most important step in this domain.

Differences in economy, culture, and social settings of regions mean that specifically tailored approaches are required for all projects. However, some critical elements of the approach are applicable/essential for projects implemented in rural areas across developing countries. Moving forward, this guidebook will equip relevant stakeholders with the necessary knowledge to initiate the critical steps required for projects that empower women and promote sustainable energy use, ensuring that the wheel is not re-invented and strong momentum is generated towards furthering the nexus between access to clean energy for rural communities and women's economic empowerment.

Photos: UN Environment Programme

Photos: UN Environment Programme

Annexes

Annex 1. List of Participants in Stakeholder Consultations

No	Stakeholder	Focal Person	Designation	Contact Information
1	National Committee for Sub-National Democratic Development	Vatanak Chheng	Deputy Director National Committee for Sub-National Democratic Development	vatanak.chheng@ncdd.gov.kh
2	Green Innovation and Development Center, Vietnam	Cao Van Ha Nguy Thi Khanh Nguy Thi Ha	Program Director Executive Director, Founder Green Development Manager	caoha@greenidvietnam.org.vn khanhgreenid@gmail.com ntha@greenidvietnam.org.vn
3	Infrastructure Development Company Limited (IDCOL), Bangladesh	Shadman bin Zahir	Investment and Project Finance Assistant Manager, Renewable Energy	szahir@idcol.org
4	BRAC University Bangladesh	Afshana Choudhury Matin Abdullah	Deputy Director, Centre for Entrepreneurship Development (CED) Associate Professor	a.choudhury@bracu.ac.bd mabdullah@bracu.ac.bd
5	SOLshare Ltd	Sebastian Groh	Managing Director	sebastian.groh@me-solshare.com
6	ARE Regional	Pierre Cazalles	Director Global Partnerships	pierre.cazelles@copperalliance.org
7	Microenergy International	Raluca Dumitrescu	Consultant	raluca.dumitrescu@microenergy-international.com
8	Women Organizing for Change in Agriculture and Natural Resource Management (WOCAN)	Nisha Onta	Regional Coordinator for Asia	nishaonta@wocan.org
9	Asian Institute of Technology	Professor Joyashree Roy	Chair Professor	joyashree@ait.ac.th
10	The Energy and Resources Institute TERI	Dr. Debajit Palit	Director, Rural Energy and Livelihoods	debajitp@teri.res.in
11	Sustainable Energy for All (SE4ALL)	Annette Aharonian	Energy Analyst	annette.aharonian@seforall.org
12	Pakistan Women in Energy Network	Nameerah Hameed	Founder, Energy Policy Consultant	nameerah@womeninenergy.pk
13	Eco Energy Pakistan	Jeremy Higgs	Founder & CEO	jeremy@ecoenergy.global
14	Lahore University of Management Sciences (Energy Institute)	Dr. Naveed Arshad	Founder Energy Institute LUMS	naveedarshad@lums.edu.pk
15	Agha Khan Rural Support Network (AKRSP)	Jamil Khan	Chief Executive Officer CEO	jamil.uddin@akdn.org

Annex 2. Approach Paper for Scoping Study on Women's Entrepreneurship and Livelihood Generation through Renewable Energy – Cambodia and Viet Nam by UNEP

Approach Paper for

Scoping Study on Women's Entrepreneurship and Livelihood Generation through Renewable Energy

CAMBODIA AND VIETNAM

1. Purpose and scope of the study

The purpose of the scoping study is to carry out a preliminary assessment in cluster of villages, which have potential for developing and enhancing women's enterprise and their income generating activities through renewable energy. The specific objectives of the study are:

1. In-depth understanding about women's existing livelihood and household activities, impact of climate hazard-prone rural livelihoods, challenges faced and possible livelihood and enterprise development options that is climate resilient and can be supported through renewable energy (both as selling of renewable energy products as well as using renewable energy for other enterprise development). This will be done through detailed discussion with the community and local stakeholders (men and women).

2. In-depth understanding of the interventions in the past, current and planned, and a record of success and failures of existing schemes, etc. This will be done through detailed discussion with other institutional players such as Government Departments, NGOs, network of social institutions, financing institutions/Bank or any bilateral livelihood programs in the area.

3. Strategies developed for project interventions in order to create and develop sustainable, climate resilient livelihood options through renewable energy

The districts and cluster of villages will be identified based on the interactions with the provincial and district administrations, partner's view and experience as well as on certain selection criteria as mentioned below. The scoping studies will also cover listing down other developmental activities/initiatives undertaken by government or any other institutions in the districts, any existing funding mechanism to support women or livelihood generation activities, any capacity building programmes and or similar relevant information

2. Approach for site selection

2.1. Selection of Provinces

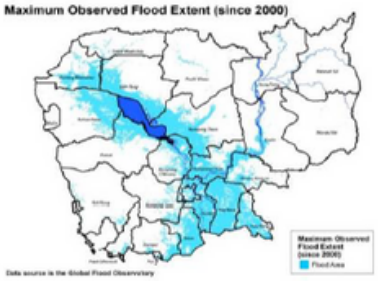
To roll out scoping and pre-feasibility studies (in implementation phase) for renewable energy and women's entrepreneurship, the following regions/provinces are identified during the inception phase. The provinces are identified based on the following preliminary selection criteria which was also validated by relevant stakeholders in each of the three country.

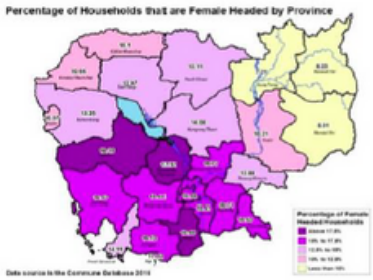
- Provinces ranking high on poverty and low on gender equality: The regions with high poverty rate where more than 40-50% of the population is below poverty line
- Regions/provinces impacted by climate change and disasters: The highly vulnerable regions with high risk index due to flood, drought, river bank erosion, saline water intrusion
- Locations where women are predominant in some value chains which offer high potential gains from energy interventions
- Existing access to energy
- Existence of local organizations/NGOs/women's groups that would take ownership of the intervention. It would be good if the energy entrepreneurship interventions can add value to an existing programme
- Supportive government machinery and developmental programmes and potential linkages with UN Women or potential partner's programmes
- Existing financing schemes for women entrepreneurship or renewable energy

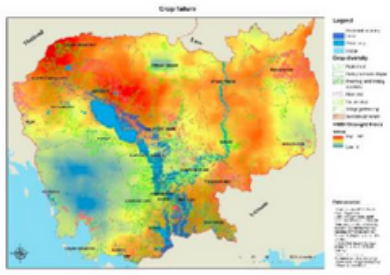
For Cambodia:

The following maps shows the various profiles of cambodia .

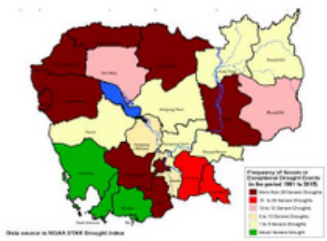
These maps suggest that the southern region (in Takeo, Kampot, Kampang Speu) may be a productive area to engage in efforts to simultaneously empower women (as the percentage of households that have female head is maximum) and increase the resilience of their communities (as these provinces have maximum observed flood extent and have a greater possibilities of crop failure either due to flood or drought) Strategies could include increasing services for and working with women farmers, particularly those in female-headed households, to promote women's leadership within communities; expanding nonfarm environmentally-resilient income-earning opportunities for women by using renewable energy technologies; and developing resilient agricultural practices and technologies through renewable energy and other practices that improve yields.

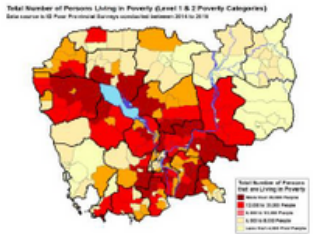


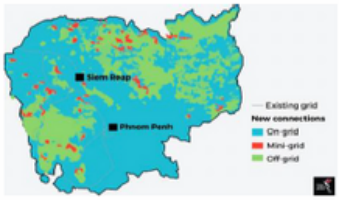




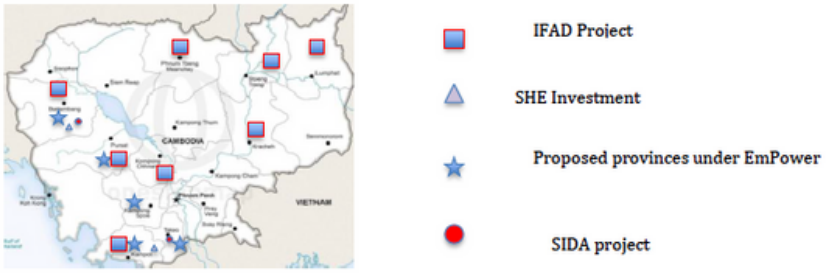
It may include solar pump with utilizing drip irrigation and exploring climate- resilient farming techniques such as aquaculture or crop diversification and phasing. Scaling up nascent initiatives to provide farmers with reputable crop insurance or expand women's landholdings would also do much to increase women's climate resilience and improve income and food security.
Similarly if the following maps are seen, besides the southern region, 1-2 provinces in the western region (Battambang and Pursat) should also be chosen based on the poverty scenarios, access to elecricity and the drought prone areas.







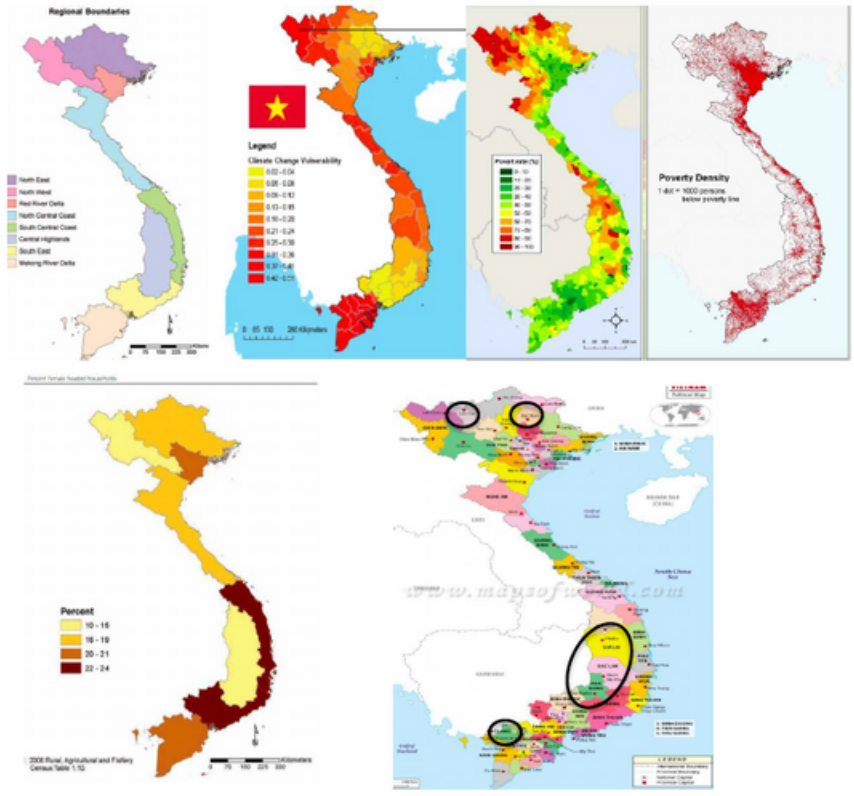
Finally, considering all different criteria and project' s priorities , 1 province i.e Pursat from western region and 1 province i.e Takeo in southern region are selected for the scoping study.



These provinces also have other interventions as shown in the map. Besides it, these two regions have livelihood generation and renewable energy financing programmes with other initiatives/agencies (such as NCDD-S, Nexus for Development, ADB etc) and thus the scope/possibilities for synergizing the activities with other initiatives in order to get maximum impact is more prominent here.

For Viet Nam:

The climate vulnerability and poverty map of Vietnam is shown below. As per the map, the northern mountain region, mekong delta region and central highland region are the regions which can be selected for scoping and pre-feasibility studies.



The Bac Kan and Lau Cai provinces in North and An Giang Provinces in Mekong Delta region as well as Dak Lak in the Central highland region will be selected for the scoping and pre-feasibility studies.. The northern and central high land have ethnic minority groups living in a climatically vulnerable condition because these are the most draught prone as well as flash flood areas in Vietnam. The poverty scenarios in these areas are very high although these communities, specially the women are engaged with number of traditional livelihood activities. Hence integrating renewable energy to enhance their economic productivity has a huge potential and can set an example for other similar provinces to follow. Besides these there is a probability of considering one site in Mekong delta region where there is different level of climate change challenges with respect to the intrusion of saline water and the possibility of showcasing innovative low-cost renewable energy technology interventions through women entrepreneurship-based business models to address these challenges.

2.2. Selection of districts and clusters for the women's livelihood assessment and primary survey

Once the provinces are finalized, the implementing partner will shortlist the districts and clusters for carrying out the primary survey and overall scoping assessment.

The selection of districts and clusters will be done based on the consultation with the provincial departments, review of secondary sources and determination of criteria such as:

i. Existing engagement of women for any type of enterprise development and livelihood generating activities (both formal and informal)

ii. Presence of progressive[1] women groups with business acumen

iii. Women with traditional skillsets for livelihood generation

iv. Challenges on rural livelihoods due to climate change impact

v. Electricity availability near the village/cluster

vi. Presence of micro-finance institution or local bank and women availing loan/credit

vii. Government initiatives on RE and/or livelihood support

viii. Willingness and interest to accept changes and cooperate

ix. Presence of people's organizations like SHG (Self Help Group), Farmer's association, women's group, others and participation of women members in the SHGs

x. Cooperation with the Govt. Departments in the village

xi. Access to primary market places and approachable road communication

3. Investigating team and preparation for survey

The implementing partner team members will be involved in the process of developing the structured questionnaire for the analysis. Several rounds of discussions are to be held for understanding the objective and scope of the study. The members, particularly the field staff, are to be briefed on the objective of the project, its activity components, approaches and the meaning of every question to be asked. They should be trained on the methods and tools of data collection. The first design of the schedule may be pre-tested in the field and the necessary modifications can be made before finally administering it in the sample villages.

All members may also be involved in a model demonstrative exercise of FGDs (Focus Group Discussions) and interviews with the individual target group, in order to make everyone understand the process and techniques of collecting information and leading FGDs.

4. Approach for women enterprise and climate resilient livelihood assessment

The assessment will be done at two levels

(A) Women's involvement where Renewable Energy is used **FOR** other enterprise and livelihood options

(B) Possibility of women's involvement where Renewable Energy is used **AS** Enterprise (i.e. selling and marketing of renewable energy products)

4.1. Approach on renewable energy for enterprise and livelihood options

A comprehensive needs assessment tool will be used to assess the viable enterprise and livelihood options for women (shown in below diagram), which comprises of

I. Natural hazard calendar;

II. Seasonal livelihood calendar for women;

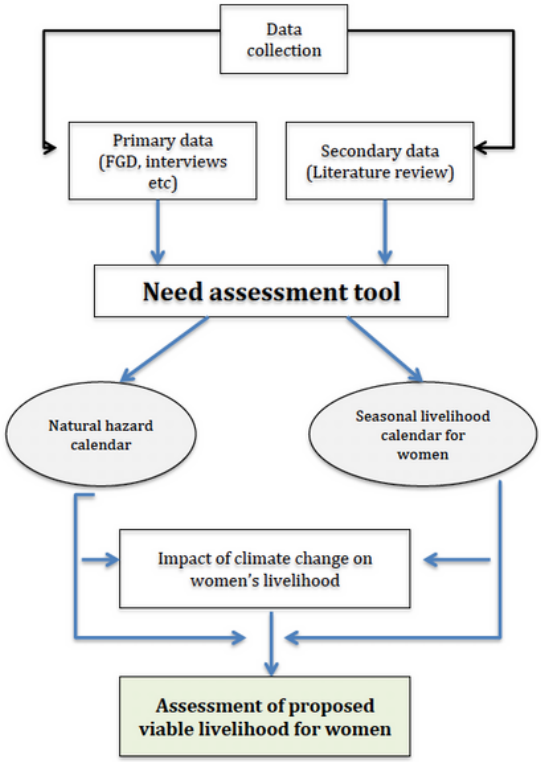
III. Mobility calendar for women;

IV. A hazard and livelihoods index; and

V. A viable livelihood options index.

[1] Women's groups supporting women's economic empowerment and gender equality

The needs assessment of viable livelihoods for women is proposed based on primary data (Focused Group Discussion, in-depth interviews, observations), secondary data, needs assessment tools (natural hazard mapping, seasonal livelihood calendar for women, hazards and livelihood index) and impacts of natural hazards or climate change on women livelihoods.



Once the viable livelihood and enterprise options are identified, the scope for integrating it with various renewable energy sources will be explored in order to improve the productivity and environmental sustainability.

4.1.1. Method for data collection

Major data will be collected through **Primary sources** with the help of *Structured Questionnaire*. Additional information will also be collected from **secondary sources** through discussions and literature review.

A) PRIMARY SOURCES

4. *Individual Interviews:* Individual woman in a family, women members of the local SHGs /women groups will be individually interviewed to seek personal opinions. Individual interviews will be conducted either with 25 samples per village/cluster or 30% of the women's population in the village. Female farmers, female involved in other businesses, female household head should be included in the individual interviews. Individual interview should also be conducted with the traders and other intermediaries who have been associated with the livelihood systems.

5. *Focus Group Discussions (FGDs):* FGDs are useful in terms of extracting qualitative information and cross-checking the same to have concrete understanding of the situation. It is necessary to keep the discussions focused and cautiously make the participants give the information sought. Each village should have at least one FGD and therefore 10 such FGDs in the sample villages (in 10 villages). Along with individual female member, female members from SHGs/women's group, women's association, farmer's group, opinion leaders (such as teacher, health worker etc), village head, other male members should be included in the FGD.

- *Observations:* the information collectors need to be careful and should verify facts through their own observations as well.

6. *Key Informant Interviews:* Opinion leaders at the village level, district level Govt. officials and the Chief Functionaries of the NGOs, manager of Micro-financing institutions or banks are to be interviewed as key informants.

B) SECONDARY SOURCES

- Collection of relevant documents and information from relevant local government offices such as District offices, Agriculture/Horticulture Office, office for rural development, NGOs, renewable energy technology providers, private sectors involved in RE or livelihood generating activities etc. who have been closely associated with the work and life of the rural women.

Target groups:

- Female household head, female farmers, female involved in other business
- Female SHGs/women's group
- Village head
- Opinion leaders
- Local govt officials, NGOs
- MFIs/Banks
- Private sectors
- Traders/intermediaries

4.1.2. Target groups and sample size

Random sampling is used to ensure that the sample is representative of the study area, while avoiding bias in the results. To summarize, following sample size will be used from various categories /target groups

Total number of villages surveyed	
Total number of individual woman interviewed (in % as well),including women with existing business	
Women group members interviewed	
Member of Farmer association interviewed	
Number of traders/intermediaries interviewed	
Number of opinion leaders interviewed	
Number of private sector/RE technology provider interviewed	
Any other	

4.1.3. Type of data collected

The following minimum information needs to be collected for subsequent analysis.

4.1.3.1. General information

General information such as name of village, district, province, geo-physical zone (coastal, flood prone, drought prone), demographic detail of the village is to be collected.

4.1.3.2. Access to basic amenities

Collect information regarding access to basic amenities such as health, drinking water, access to rural credits, access to nearby market, source of irrigation etc. Also find out the type and source of energy used at household for cooking, lighting, water heating

4.1.3.3. *Information related to natural hazard calendar*

Type of hazards (drought, flooding, salinity intrusion, river erosion etc) possible months of occurrence of those hazards and hazard risk intensity (low/medium high) in the cluster

4.1.3.4. Existing livelihood practices with seasonal livelihood calendar for women

This will include broad information regarding the current occupation of men and women in the selected cluster/village. In addition to it, the seasonal livelihood calendar (for individual woman interviewed as well as women as a whole in the cluster) (may be represented as below) should be prepared, which would give a fair idea about the involvement of women in different activities in different time of the year.

LIVELIHOOD	% of women													Affected due to which hazard
		JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	
Livelihood 1														
Livelihood 2														
Livelihood 3														
Livelihood 4														
Livelihood 5														

4.1.3.5. Degree and duration of climate hazards impact on women's livelihood

For each of the above livelihood, find out the impact (degree and duration) of various climate hazards and its impact on the overall life of the community.

4.1.3.6. Traditional skills of the women for livelihood generation

List down the traditional skills of the women (contributing to livelihood generation and household work) and whether they do it individually or in a group.

4.1.3.7. Women's group

Collect information regarding the working culture in the community, specifically within women. Find out if they work in a group, if there is any women's group or not. If yes, what are their main activities and if there is no group culture then what is the reason behind that.

4.1.3.8. Type of institutions in the village/cluster

List down the name and activities of different institutions present in the village (e.g.. NGO, Women's SHGs, women's group, farmer's group, Micro-financing institutions etc.)

4.1.3.9. Government and other interventions

Collect information regarding the past and on-going government activities and other developmental activities in the village/cluster

4.1.3.10. Viable livelihood options identified by the women in the study clusters

Identify the potential viable livelihood options that can be taken up by women along with its social acceptance and future risks of these livelihood options in the community. Information such as proposed list of livelihood options, its justification, type of resources required, whether manages individually or in a group, future risk and constraints, type of institutions/organization to be involved, is to be collected. Along with the viable livelihood option, the list of potential women groups who can take up such livelihood options should also be identified and prepared.

4.1.3.11. Information regarding energy requirement for each of the abovementioned livelihoods

Find out the input/motive power/heating/drying/energy required (and their existing source) for each of the existing and proposed livelihood options

4.1.3.12. Information regarding women and rural credit

Access to credit and finance, bank loans and supporting mechanisms for women in small-scale businesses and commerce.

4.2. Approach on women's involvement in Renewable Energy used AS Enterprise

Here the main objective is to assess various energy demands and energy supply options of each of the cluster/village and if there is any potential market that exist for the sale and after sale service for energy efficient and renewable energy products. Besides this, the assessment will also include the identification of potential individual or group of women who would be interested to take up such business if there is a potential market.

4.2.1. Method for data collection

The data can be collected through community meeting and through interviews with key Informant such as Opinion leaders at the village level, district level Govt. officials and the Chief Functionaries of the NGOs, manager of Micro-financing institutions or banks

4.2.2. Type of data collected

The following information will be collected

4.2.2.1. Existing energy scenario in the village

Find out the information regarding electrification scenarios, quality and reliability of power supply, how the cooking energy demand is fulfilled (Fuelwood/cow dung/LPG/induction heater/biogas/others); what is the source of irrigation (rain-fed only/ Diesel pumpset/electric connection etc.)

4.2.2.2. Existing energy use pattern

Find out the existing type and usage pattern of various products used for cooking, lighting and other household electrical appliances, heating water, along with its benefits and challenges. Also find out information on if there is any pump-set, other appliances used for any productive application in the village. Getting information on how they manage during climate hazards would be useful Find out why they are NOT using energy efficient and renewable energy products so far.

4.2.2.3. Potential demand for various energy efficient and renewable energy products

Identify the potential demand for various energy efficient and renewable energy products along with any potential individual/group who can take up the business of selling such products

5. Way forward

The information collected will be used for analysis and further assessment

References

1. Sustainable livelihood guidance sheets by DfID
2. Assessment of women's livelihood needs in three eco-zones of Bangladesh by BCAS and UN women
3. Baseline survey for project output and Livelihood support assessments by UNHCR and DCA Actalliance, 2017
4. A study on the livelihood situation of Tribal communities in Raigad district of Maharastra state prepared by Prayas, India in January 2005
5. Rural electrification and livelihood generation for women enterprises in rural India: Expereicnes of implementing two state biomass gasifier- by Sunil dhingra, Barkha Tanvir, Ulrik Birk Henriksen, Pierre Jabyedoff, Shrish Sinha and Daniel Ziegerer
6. A report on livelihood analysis in Rayagada district of Odisha, prepared by Centre for Community Development and International Development Enterprises
7. Practical guide for socio-economic livelihood, land tenure and rights surveys for use in collaborative ecosystem based land use planning by Centre for International Forestry Research (CIFOR)
8. Women's empowerment through electricity access scoping study and proposal for a framework analysis- by Tanja Winther, Margaret N Matinga, Kirsten Ulsrud and Karina Standal
9. Sustainable livelihoods and project design in India- Working Paper No 127 , Turton, C. (2000) London: ODI
10. Sustainable Rural Livelihoods: Practical Concepts for the 21st Century, by Chambers, R. and Conway, G, IDS Discussion Paper No. 296, Brighton, UK, Institute of Development Studies
11. Detailed discussions with implementing partners of EmPower (i.e CHIASE, Green ID, Nexus for Development, NCDDS and IDCOL)
12. Informal interactions with experts from The energy and Resources Institute (TERI)
13. Personal interactions with Mr Swapnil Sekhar, Chief Operating Officer and Director Evaluation, Sambodhi Research and Communication
14. Focused Group interaction with experts from Oxfam, Cambodia
15. Informal interactions with Mr Ashok Choudhury, Director, Odisha Renewable Energy Development Agency

Annex 3. Approach Paper for Scoping Study on Women's Entrepreneurship and Livelihood Generation through Renewable Energy – Bangladesh by UNEP

Approach Paper

Scoping Study for Women's Entrepreneurship and Livelihood Generation through Renewable Energy

BANGLADESH

1. Purpose and scope of the study

The purpose of this scoping study is to carry out a preliminary assessment in selected mini-grid clusters and areas within 10 kms radius of the mini-grid plants in **Bhola Monpura, Jamalpur, Kurigram, Faridpur/Sirajganj** districts , implemented under IDCOL mini-grid programme. The study will identify the potential livelihood generating options and women's enterprise that can be developed /strengthened within the mini-grid cluster. The specific objectives of the study in the selected clusters are:

1. In-depth understanding about women's existing livelihood and household activities, impact of climate hazard-prone rural livelihoods, challenges faced and possible livelihood and enterprise development options that is climate resilient and can be supported through renewable energy (both as selling of renewable energy products as well as using renewable energy for other enterprise development). This will be done through detailed discussion with the community and local stakeholders (men and women).

2. In-depth understanding of the interventions in the past, current and planned, and a record of success and failures of existing schemes, etc. This will be done through detailed discussion with other institutional players such as Government Departments, NGOs, network of social institutions, financing institutions/Bank or any bilateral livelihood programs in the area.

3. Strategies developed for project interventions in order to create and develop sustainable, climate resilient livelihood options through renewable energy

The mini-grid clusters and districts have already been identified by IDCOL based on consultations with their Partner Organizations and other stakeholders as well as on certain selection criteria as mentioned below. The scoping studies will also cover listing down other developmental activities/initiatives undertaken by government or any other institutions in the districts, any existing funding mechanism to support women or livelihood generation activities, any capacity building programmes and or similar relevant information

2. Approach for site selection

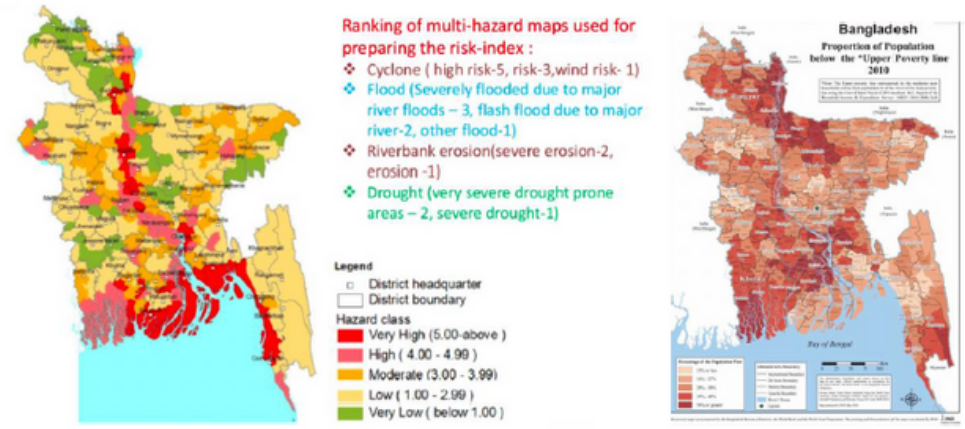
2.1. Selection of Provinces and districts

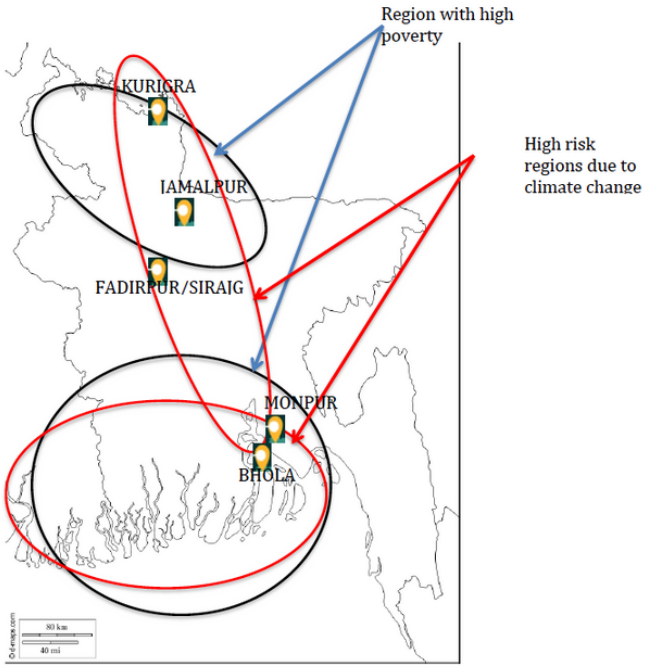
To roll out scoping and pre-feasibility studies (in implementation phase) for renewable energy and women's entrepreneurship, the provinces and districts are identified based on the following preliminary selection criteria which was also validated by relevant stakeholders

- Provinces where IDCOLs mini-grid systems have been implemented. Currently the mini-grid systems have not been fully utilized and thus the un-utilized energy generated from the solar mini-grids can be used for various livelihood-generating activities, run by women. Such linkages will not only improve the viability of existing mini-grid system (by increasing the capacity utilization factor) but it would also help the women in those mini-grid clusters to generate their own income

- Provinces ranking high on poverty and low on gender equality: The regions with high poverty rate where more than 40-50% of the population is below poverty line
- Regions/provinces impacted by climate change and disasters: The highly vulnerable regions with high risk index due to flood, drought, river bank erosion, saline water intrusion
- Locations where women are predominant in some value chains which offer high potential gains from energy interventions
- Existence of local organizations/NGOs/women's groups that would take ownership of the intervention. It would be good if the energy entrepreneurship interventions can add value to an existing programme
- Supportive government machinery and developmental programmes; Government initiatives on RE and/or livelihood support and willingness and interest by districts and provincial governments to accept changes and cooperate
- Existing financing schemes in districts and provinces for women entrepreneurship or renewable energy and/or presence of micro-finance institution or local bank and women availing loan/credit
- Access to primary market places and approachable road communication

The high risk regions due to climate change as well as the high poverty zone in Bangladesh is shown in the map.





The above two maps are superimposed in the below map to identify the zones which are impacted heavily by climate change and at the same time have majority of its population below poverty line. Based on these and as per the discussions with stakeholders 2 districts (**Bhola and Monpura**) in South and 2-3 districts (**Jamalpur, Kurigram, Faridpur/Sirajganj**) in North, where both regions are very vulnerable to climate change and their scale of vulnerability are different.

In Northern region, the sites are selected because these areas are affected by drought and flash flood, poverty and has limited options for women to improve their livelihood activities. There is also a lack of awareness about climate induced health problems, a high number of relocated landless families due to river erosion and strong gender inequalities.

In Southern region, the sites identified have high salinity in water along with limited livelihood options for women. The region has strong potential for scaling up of renewable energy based livelihood generation interventions. In both sites, IDCOL are implementing renewable energy projects along with presence of strong local institutions and through the support of EmPower, renewable energy can be made available for the women and support them in increasing their livelihood generation through renewable energy technologies.

In total, mini-grid clusters in 2 districts (Bhola and Monpura) in South region and 3 districts (Jamalpur, Kurigram, Faridpur/Sirajganj) in North region were selected for carrying out the scoping studies.

3. Investigating team and preparation for survey

The implementing partner team members (ie. IDCOL) and the consultant hired under by UN Environment will be involved in the process of developing the structured questionnaire (as per this approach paper) for carrying out the scoping studies and subsequent analysis. Several rounds of discussions are to be held for understanding the objective and scope of the study. The members, particularly the field staff and /or the consultant, are to be briefed on the objective of the project, its activity components, approaches and the meaning of every question to be asked. They should be trained on the methods and tools of data collection. The first design of the schedule may be pre-tested in the field and the necessary modifications can be made before finally administering it in the sample villages/mini-grid clusters

All members, take part in the baseline survey, may also be involved in a model demonstrative exercise of FGDs (Focus Group Discussions) and interviews with the individual target group, in order to make everyone understand the process and techniques of collecting information and leading FGDs.

4. Approach for women enterprise and climate resilient livelihood assessment

The assessment will be done at two levels

(A) Women's involvement where Renewable Energy is used **FOR** other enterprise and livelihood options

(B) Possibility of women's involvement where Renewable Energy is used **AS** Enterprise (i.e. selling and marketing of renewable energy products)

4.1. Approach on renewable energy for enterprise and livelihood options

A comprehensive needs assessment tool will be used to assess the viable enterprise and livelihood options for women (shown in below diagram), which comprises of

I. Natural hazard calendar;

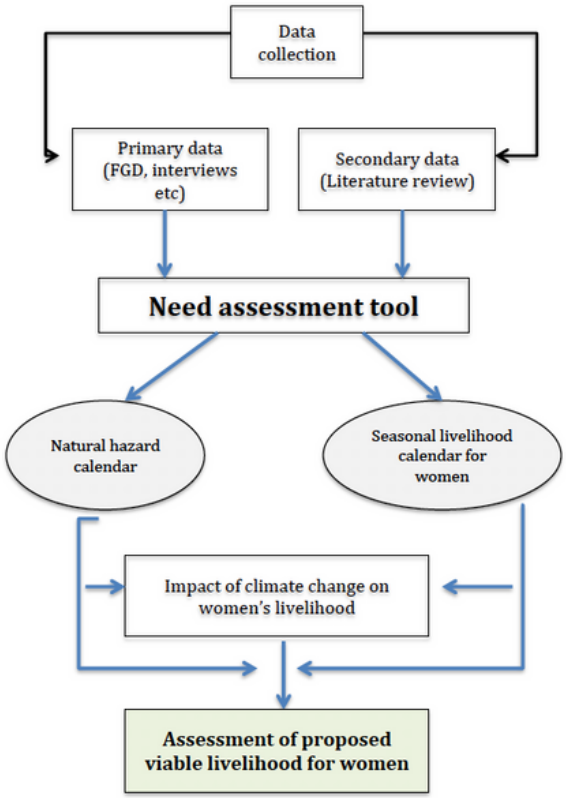
II. Seasonal livelihood calendar for women;

III. Mobility calendar for women;

IV. A hazard and livelihoods index; and

V. A viable livelihood options index.

The needs assessment of viable livelihoods for women is proposed based on primary data (Focused Group Discussion, in-depth interviews, observations), secondary data, needs assessment tools (natural hazard mapping, seasonal livelihood calendar for women, hazards and livelihood index) and impacts of natural hazards or climate change on women livelihoods.



Once the viable livelihood and enterprise options are identified, the scope for integrating it with existing mini-grid system will be explored in order to improve the productivity and environmental sustainability.

4.1.1. Method for data collection

Major data will be collected through **Primary sources** with the help of *Structured Questionnaire*. Additional information will also be collected from **secondary sources** through discussions and literature review.

A) PRIMARY SOURCES

1. *Individual Interviews:* Individual woman in a family, women members of the local SHGs / women groups will be individually interviewed to seek personal opinions. Individual interviews will be conducted either with 25 samples or 30% of the women's population per mini-grid cluster. Female farmers, female involved in other businesses, female household head should be included in the individual interviews.

Individual interview should also be conducted with the traders and other intermediaries who have been associated with the livelihood systems.

2. *Focus Group Discussions (FGDs):* FGDs are useful in terms of extracting qualitative information and cross-checking the same to have concrete understanding of the situation. It is necessary to keep the discussions focused and cautiously make the participants give the information sought. Each mini-grid cluster should have at least one FGD. Along with individual female member, female members from SHGs/women's group, women's association, farmer's group, opinion leaders (such as teacher, health worker etc), village head, other male members should be included in the FGD.

- *Observations:* the information collectors need to be careful and should verify facts through their own observations as well.

3. *Key Informant Interviews:* Opinion leaders at the village level, district level Govt. officials and the Chief Functionaries of the NGOs, manager of Micro-financing institutions or banks are to be interviewed as key informants.

B) SECONDARY SOURCES

- Collection of relevant documents and information from relevant local government offices such as District offices, Agriculture/Horticulture Office, office for rural development, NGOs, renewable energy technology providers, private sectors involved in RE or livelihood generating activities etc. who have been closely associated with the work and life of the rural women.

Target groups:

- Female household head, female farmers, female involved in other business
- Female SHGs/women's group
- Village head
- Opinion leaders
- Local govt officials, NGOs
- MFIs/Banks
- Private sectors
- Traders/intermediaries
- Any other relevant stakeholder

4.1.2. Target groups and sample size

Random sampling is used to ensure that the sample is representative of the study area, while avoiding bias in the results. To summarize, following sample size will be used from various categories /target groups

Total number of villages surveyed	
Total number of individual woman interviewed (in % as well),including women with existing business	
Women group members interviewed	
Member of Farmer association interviewed	
Number of traders/intermediaries interviewed	
Number of opinion leaders interviewed	
Number of private sector/RE technology provider interviewed	
Any other	

4.1.3. Type of data collected

The following minimum information needs to be collected from the selected sites for subsequent analysis.

4.1.3.1. General information

General information such as name of village, district, province, geo-physical zone (coastal, flood prone, drought prone), demographic detail of the village is to be collected.

4.1.3.2. Access to basic amenities

Collect information regarding access to basic amenities such as health, drinking water, access to rural credits, access to nearby market, source of irrigation etc. Also find out the type and source of energy used at household for cooking, lighting, water heating

4.1.3.3. Information related to existing mini-grid system

The installed capacity of the mini-grid system, existing energy usage pattern, energy services provided to different categories (Residential commercial, institutional etc), tariff structure etc need to collected to understand the baseline scenario of each of the mini-grid system

4.1.3.4. *Information related to natural hazard calendar*

Type of hazards (drought, flooding, salinity intrusion, river erosion etc) possible months of occurrence of those hazards and hazard risk intensity (low/medium high) in the cluster

4.1.3.5. Existing livelihood practices with seasonal livelihood calendar for women

This will include broad information regarding the current occupation of men and women in the selected cluster/village. In addition to it, the seasonal livelihood calendar (for individual woman interviewed as well as women as a whole in the cluster) (may be represented as below) should be prepared, which would give a fair idea about the involvement of women in different activities in different time of the year.

LIVELIHOOD	% of women													Affected due to
		JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	which hazard
Livelihood 1														
Livelihood 2														
Livelihood 3														
Livelihood 4														
Livelihood 5														

4.1.3.6. Degree and duration of climate hazards impact on women's livelihood

For each of the above livelihood, find out the impact (degree and duration) of various climate hazards and its impact on the overall life of the community.

4.1.3.7. Traditional skills of the women

List down the traditional skills of the women (contributing to livelihood generation and household work) and whether they do it individually or in a group.

4.1.3.8. Women's group

Collect information regarding the working culture in the community, specifically within women. Find out if they work in a group, if there is any women's group or not. If yes, what are their main activities and if there is no group culture then what is the reason behind that.

4.1.3.9. Type of institutions in the village/cluster

List down the name and activities of different institutions present in the village (e.g.. NGO, Women's SHGs, women's group, farmer's group, Micro-financing institutions etc.)

4.1.3.10. Government and other interventions

Collect information regarding the past and on-going government activities and other developmental activities in the village/cluster

4.1.3.11. Viable livelihood options identified by the women in the study clusters

Identify the potential viable livelihood options that can be taken up by women along with its social acceptance and future risks of these livelihood options in the community. Information such as proposed list of livelihood options, its justification, type of resources required, whether manages individually or in a group, future risk and constraints, type of institutions/organization to be involved, is to be collected. Along with the viable livelihood option, the list of potential women groups who can take up such livelihood options should also be identified and prepared.

4.1.3.12. Information regarding energy requirement for each of the abovementioned livelihoods

Find out the input/motive power/heating/drying/energy required (and their existing source) for each of the existing and proposed livelihood options

4.1.3.13. Information regarding women and rural credit

Access to credit and finance, bank loans and supporting mechanisms for women in small-scale businesses and commerce.

4.2. Approach on women's involvement in Renewable Energy used AS Enterprise

Here the main objective is to assess various energy demands and energy supply options of each of the cluster/village and if there is any potential market that exist for the sale and after sale service for energy efficient and renewable energy products. Besides this, the assessment will also include the identification of potential individual or group of women who would be interested to take up such business if there is a potential market.

4.2.1. Method for data collection

The data can be collected through community meeting and through interviews with key Informant such as Opinion leaders at the village level, district level Govt. officials and the Chief Functionaries of the NGOs, manager of Micro-financing institutions or banks

4.2.2. Type of data collected

The following information will be collected

4.2.2.1. Existing energy scenario in the village

Find out the information regarding electrification scenarios, quality and reliability of power supply, how the cooking energy demand is fulfilled (Fuelwood/cow dung/LPG/induction heater/biogas/others); what is the source of irrigation (rain-fed only/ Diesel pumpset/electric connection etc.)

4.2.2.2. Existing energy use pattern

Find out the existing type and usage pattern of various products used for cooking, lighting and other household electrical appliances, heating water, along with its benefits and challenges. Also find out information on if there is any pump-set, other appliances used for any productive application in the village. Getting information on how they manage during climate hazards would be useful Find out why they are NOT using energy efficient and renewable energy products so far.

4.2.2.3. Potential demand for various energy efficient and renewable energy products

Identify the potential demand for various energy efficient and renewable energy products along with any potential individual/group who can take up the business of selling such products

5. Way forward

The information collected will be used for analysis and further assessment

References

1. Sustainable livelihood guidance sheets by DfID
2. Assessment of women's livelihood needs in three eco-zones of Bangladesh by BCAS and UN women
3. Baseline survey for project output and Livelihood support assessments by UNHCR and DCA Actalliance, 2017
4. A study on the livelihood situation of Tribal communities in Raigad district of Maharastra state prepared by Prayas, India in January 2005
5. Rural electrification and livelihood generation for women enterprises in rural India: Expereicnes of implementing two state biomass gasifier- by Sunil dhingra, Barkha Tanvir, Ulrik Birk Henriksen, Pierre Jabyedoff, Shrish Sinha and Daniel Ziegerer
6. A report on livelihood analysis in Rayagada district of Odisha, prepared by Centre for Community Development and International Development Enterprises
7. Practical guide for socio-economic livelihood, land tenure and rights surveys for use in collaborative ecosystem based land use planning by Centre for International Forestry Research (CIFOR)
8. Women's empowerment through electricity access scoping study and proposal for a framework analysis- by Tanja Winther, Margaret N Matinga, Kirsten Ulsrud and Karina Standal
9. Sustainable livelihoods and project design in India- Working Paper No 127 , Turton, C. (2000) London: ODI
10. Sustainable Rural Livelihoods: Practical Concepts for the 21st Century, by Chambers, R. and Conway, G, IDS Discussion Paper No. 296, Brighton, UK, Institute of Development Studies
11. Detailed discussions with implementing partners of EmPower (i.e CHIASE, Green ID, Nexus for Development, NCDDS and IDCOL)
12. Informal interactions with experts from The energy and Resources Institute (TERI)
13. Personal interactions with Mr Swapnil Sekhar, Chief Operating Officer and Director Evaluation, Sambodhi Research and Communication
14. Focused Group interaction with experts from Oxfam, Cambodia
15. Informal interactions with Mr Ashok Choudhury, Director, Odisha Renewable Energy Development Agency

Annex 4. Processes and Tools for Scoping and Feasibility Studies adopted by EmPower's partners, CHIASE and Green ID

EmPower Scoping Study

CHIASE & GreenID

Process and Tools

A. Introduction

Strengthening Human Rights and Gender Equality through Climate Change Action and Disaster Risk Reduction *(EmPower– Women for Climate Resilient Societies)*: The Project aims to contribute to the overall long-term Outcome of 'Countries In Asia and the Pacific Implement Gender-Responsive Climate Change and DRR Actions to Address Key-Drivers of Gender-Based Vulnerabilities". In order to achieve this long-term Outcome, the Project will invest in five outcome areas as follows:

1. Outcome 1: CSOs representing women and women's groups are able to lead, participate in and influence climate change and DRR decision-making processes;
2. Outcome 2: Governments and key stakeholders are able to generate, analyze and use sex, age, and diversity disaggregated data to inform climate change and disaster risks and actions;
3. Outcome 3: National policy-makers are able to integrate gender equality commitments in climate change and DRR policies;
4. **Outcome 4: Women use RE to increase adaptive capacity and enhance climate-resilient livelihoods;**
5. Outcome 5: Regional normative and policy frameworks on climate change and DRR incorporate gender equality and human rights perspective.

The project will be implemented in three countries in Asia - Bangladesh, Cambodia and Vietnam; and regional level activities to influence the intergovernmental and normative regional processes for climate change and disaster risk reduction to be more gender-responsive. The five-year project is a partnership between UN Women and UN Environment and funded by the Swedish International Development Cooperation Agency (Sida).

CHIASE and GreenID works under **Outcome 4: Women use RE to increase adaptive capacity and enhance climate-resilient livelihoods.**

The objective of outcome 4, led by UN Environment, is to **support women to become renewable energy entrepreneurs and to access renewable energy to increase livelihoods and economic empowerment – for climate resilient societies**. Through on-the-ground implementation in selected regions, together with the key partners, the project will train women and set up appropriate financial instruments to access funds. Other key outputs will be the development of national approach paper and provincial action plans.

As part of the project implementation phase that started in January 2019, under this SSFA, UN Environment will obtain expert services and coordination support from CHIASE in carrying out the scoping studies and pre-feasibility studies in Lao Cai and Bac Kan provinces. CHIASE will also collaborate and maintain a close coordination with additional implementing partner Green ID, who will conduct scoping and pre-feasibility studies in An Giang and Dac Lak provinces. Coordination at the provincial level will be done with Viet Nam Women's Union.

The purpose of the scoping study is to carry out a preliminary assessment in cluster of villages, which have potential for **developing and enhancing women's enterprise and their income generating activities through renewable energy**. The specific objectives of the study are:

1. In-depth understanding about women's existing livelihood and household activities, impact of climate hazard-prone rural livelihoods, challenges faced and possible livelihood and enterprise development options that is climate resilient and can be supported through renewable energy (both as selling of renewable energy products as well as using renewable energy for other enterprise development). This will be done through detailed discussion with the community and local stakeholders (men and women).
2. In-depth understanding of the interventions in the past, current and planned, and a record of success and failures of existing schemes, etc. This will be done through detailed discussion with other institutional players such as Government Departments, NGOs, network of social institutions, financing institutions/Bank or any bilateral livelihood programs in the area.
3. Strategies developed for project interventions in order to create and develop sustainable, climate resilient livelihood options through renewable energy

The districts and cluster of villages will be identified based on the interactions with the provincial and district administrations, partner's view and experience as well as on certain selection criteria as mentioned below. The scoping studies will also cover listing down other developmental activities/initiatives undertaken by government or any other institutions in the districts, any existing funding mechanism to support women or livelihood generation activities, any capacity building programmes and or similar relevant information.

The below Process and Tools are developed by CHIASE&GreenID with technical supports from UN Environment team based on the *Methodology for scoping and baseline assessment* of the program.

Based on this Process and Tools guideline, each organization may have further developed detailed questions to fit with the nature, custom and working culture/staff's skills of each organization.

B. Process and Tools

1. Steps to proceed

- Develop list of information to be collected
- Collect secondary information from documents, reports from provinces, districts, communes, organizations and other sources.
- Develop tools and questionnaires
- Field survey
- Reporting

Capacity building/discussion among the study team is along with this process.

2. Field survey

Field activities include the following, depending on the human resources mobilized and travel conditions, some activities can be arranged in parallel with other activities.

- Activity 1: Interview with provincial, district and commune officials and related organizations. Collect additional reports and secondary information (Tool 1)
- Activity 2: Collect secondary information of the village and interview the Village Head/ Village Management Board including the head of village women union and village electricity officer (if has); Tool 2.
- Activity 3: Conduct a Natural hazard calendar tool, and after that with the tool Hazard and livelihoods index with 1 group of 5-7 women in the village (Tools 3 and 4)
- Activity 3: Conduct a Seasonal livelihood calendar tool, then continue the Mobility calendar for women with 1 group of 5-7 women in the village (Tools 5 and 6)
- Activity 4: Implementation of the Viable livelihood options tool with group of 5-7 women in the village (Tool 7).
- Activity 6: Interview with other relevant groups and individuals in the village (total of 25 women interviewed including women of single households, women in group / business, single women headed households, health workers, village extension workers, businesses/traders in villages, etc. (Tools 8 and 9).

3. Methods and Tools

Information collection tools and methods, as in the following sections, follow participatory methods, especially women's participation and decision-making.

Tool 1: Information to collect at provincial, district and commune levels

General information such as name of village, district, province, geo-physical zone (coastal, flood prone, drought prone), demographic detail of the village is to be collected as groups of information below.

#	Information to collect	Main sources	Remarks
1	General information on the location and socio-economic situation in the area (geographical location, natural conditions, population, ethnic composition, poverty rate, etc.).	• Secondary data • Interview related officials	See more details in Tool 2 (Interview with village leaders)
2	Information on main sources of income (of both men and women)and related resources (area of agricultural and forestry land, etc.).	• Secondary data • Interview related officials	See more details in Tool 2 (Interview with village leaders)
3	Businesses, groups in the area, networks / forums	• Secondary data • Interview related officials	Especially related to livelihoods for women, energy.
4	Information about the situation of weather, natural disasters, climate change and impacts	• Secondary data • Interview related officials	Note The highly vulnerable area with suburban risk due to flood, drought, river bank erosion, saline water intrusion

5	Information about the situation of energy use and the potential for renewable energy applications in livelihood activities as well as business opportunities	• Secondary data • Interview related officials	Refer to tools 8 and 9 (interview with individuals and groups)
6	Information about credit, presence of local banks providing loans	• Secondary data • Interview related officials	See more details in Tool 2 (Interview with village leaders)
7	Information about women and gender development	• Secondary data • Interview related officials	In the fields of economic development, energy, disaster prevention and gender equality.
8	Information about related programs and projects of the Government and other organizations in the area (NGOs, companies ...)	• Secondary data • Interview related officials	Including past, current and planned information for the coming time

Tool 2: Information of the village collected from Village Head/Village Management Board/head of WU and electricity officer

General information such as name of village, district, province, geo-physical zone (coastal, flood prone, drought prone), demographic detail of the village is to be collected. More detailed as the below (interview to get more information about name, type, quality, difficulties, causes, solution, etc.

Village name ..... Commune..... Date ....).

#	Village information	Unit	Quantity	Note
1	**The total area of natural land**			
2	**Population**			
	Total number of households			
	Total number of persons			
	- Male			
	- Female			
	Divided by ethnicity (%)			
	Number of poor HH			
	Number of near poor HH			
	Number of single women headed HH			
	Other types of poor, vulnerable households			
3	**Main sources of income/production in the village and number of related HH**			Need to ask if any specific for women
	Agriculture			
	Forestry			
	Aquaculture			
	Credit			
	Services			
	Others			
4	**Information on Forestry**			
	Forest land with forest area			
	Forest land without forest			
	Number of HH got forest land allocated			

	Forest land area allocated for one HH on average					
5	**Information about agriculture**					
	Paddy field for Rice					
	Area					
	Yield					
	Number of HH has					
	Area on 1 HH on average					
	Land for other crops					
	Crop	**Area (Ha)**	**Yield**	**No of HH**		
	Area on 1 HH on average					
	Annual industrial crops (soybeans, peanuts, sugar cane (if any specify each type)					
	Area					
	Yield					
	Number of HH has					
	Area on 1 HH on average					
	Area of perennial plant (tea, coffee, etc.)					
	Area					
	Yield					
	Number of HH has					
	Area on 1 HH on average					
	Livestock – Poultry					
	Number of buffalos					
	Number of cows					
	Number of pigs					
	Number of poultries					
	Others					
6	**Groups in the village (interest, self-help, collaboration, cooperatives, etc.,**					
	Total number of groups					
	Specific type					
	-…					
	Type of energy/facilities used by groups for production/services					
7	**Other business and organizations operating in the village**					
	For agriculture/business					
	For energy					
	For credit					
	Others					
8	**Good exchange, market, shops**					
	The number of markets in the village					
	Distance to the nearest market					
	Number of trading shops (official stores, agents, household shops) and other services					
9	**Drinking water**					
	Number of households having drinking water systems					
	Number of households use water from wells					

	Number HH use water from natural sources (stream, etc.)			
	Number of people using pure drinking water (bottle)			
	Distance to where to buy bottled / bottled water			
10	**Health**			
	Distance to the nearest medical station			
	Village health services			
	Percentage of people with health insurance			
	Proportion of people using village health services			
	Proportion of people using commune health services			
	Percentage of people using health services at district, province, national levels.			
11	**Irrigation**			
	Number of irrigation system/ km of canals			
	Number of pumping station			
	Number of pools/areas			
	The total irrigated area fully irrigated			
	Total of areas lack of water			
	Type of energy/facilities used for irrigations			
12	**Energy**			
12.1	*Type of electricity sources (grid electricity, electricity, battery, solar power ...)*			
	Total households have electricity			
	Number of households using electricity from national net			
	Number of households using electricity from HH water station			
	Number of households using solar electricity			
	Average electricity cost / month of the household			
12.2	*Lighting equipment*			
	Number of households with electricity using incandescent light bulbs			
	Number of households with electricity using electricity-saving LED bulbs			
	Number and type of public lighting bulbs			
	Number of households with electricity using incandescent light bulbs			
	Other (specify)			
12.3	*Energy used for cooking*			
	Number of households cooking by electricity grid			
	Number of households cooking by solar power source			
	Number of households cooking with gas			
	Number of households cooking with gas from Biogas cellar			
	Number of households cooking with wood			
	Other (specify)			
12.4	*Energy used for agricultural production*			
	Number of households with milling machines			
	Number of households with rice threshers running electric motors			
	Number of households with eyebrows plowed			

	Number of households using diesel pumps			
	Other (specify)			
12.5	*Energy for traffic*			
	Number of gasoline-powered motorcycles			
	Number of electric bicycles			
	Number of bicycles			
12.6	*Energy for other people's activities*			
	Number of households with a radio			
	Number of households with television			
	Number of households with phones			
	Number of households using fans			
	Number of households using electric water heaters			
	Number of households using solar water heaters			
	Number of households using air conditioner			
	Number of households using refrigerators			
	Other (specify)			
15	**Credit**			
	Number of groups borrowed loan (especially women groups)			Name of bank, amount of loan, duration, interest, difficulties, etc.
	Number of HH borrowed loan (especially women)			Name of bank, amount of loan, duration, interest, difficulties, etc.
16	**Name and activities of Government, NGO, Private sectors, etc. in the village in the last three years, present and in coming time**			Especially related to women, climate change, energy
	Government			Write down their main activities
	NGO, CSOs…, VWU			
	Company			
	Others (including donor agency)			
17	**Traditional cultural festivals, community organizations**			Especially related to women
	Number of traditional festival in the village (name in note column)			
	Number of organizations (specify name)			
	Number of clubs (names)			
	Number of other community organizations			
	Farmers association, women's groups			Name those women's groups and their main activities
18	**The information on training**			
	Number of trainings on agriculture and forestry conducted in the past 3 years.			Who conducted the training
	Total number of farmers / village officers participating in training courses on agriculture and forestry in the past 3 years.			
	The number of women participating in the training in agriculture and forestry in the past 3 years.			
	The number of training courses on climate change in the past 3 years			
	Number of participants in training courses on climate change in the past 3 years			
	Number of trainings on gender issues in the past 3 years			

	Number of participants in training courses on gender issues in the past 3 years.			
	The other training in the past 3 years (such as green energy use, etc., if any).			
19	**Any other information or proposed by the village board**			

The following are specific tools for groups discussions and semi-structure interview with some important notes

- The scoring, evaluation is not too important information, this is just a tool and a promotion method.
- Records of causes, impacts and solutions are important information that we need to collect.
- Therefore, in 99% of cases, when people evaluate, give points/scores, do not discuss "right and wrong", the people after discussion can revise the points, but not the project/ research team.

Always collect information about:

- Skills/Traditional techniques apply
- Difficulties, causes, solution and capacity building needs
- Collect information regarding the working culture in the community, specifically within women. Find out if they work in a group, if there is any women's group or not. If yes, what are their main activities and if there is no group culture then what is the reason behind that.

Need specific collecting information to identify:

a) About existing women-based enterprises and women's existing livelihood activities; existing challenges.

b) Potential enterprises and livelihood options where renewable energy can be used to augment women's economic opportunities

c) Potential enterprise development options with renewable energy (for example: selling of solar products, improved cookstove etc.)

d) Potential women's groups /business women who can take up the enterprises (potential women who would be interested to start this business)

In summary, point a and b is related to any livelihood/enterprise where renewable energy is used as a source of energy supply and point c and d is related to RE enterprise, where RE products and services are sold. In all the cases, it's only for women).

Tool 3: Disaster Calendar

Process

- Introduce objective, process and participants
- Facilitate discussion
- Fill information as the below table (use A0 paper)

Type of disaster	Time in year	Duration	Frequency	Impact	Impact on women and girls

Use the below information for facilitation

1. Types of disasters may include:
   - ✓ The hot sun persisted
   - ✓ Increased drought, especially high level drought
   - ✓ Appears many cold spells
   - ✓ Rime
   - ✓ Heavy rain
   - ✓ Flash floods
   - ✓ Flood
   - ✓ Storm, ... etc
2. Ask whether the trend of change and impact caused by extreme weather conditions includes:
   - ✓ Changes in time, frequency, intensity,
   - ✓ Trend: compared to before, starting from when, late rain, late storm, increasing intensity ...
   - ✓ etc.
3. Ask about how the impacts of natural disasters affect production and the lives of people, especially women and girls.
4. Ask about the experience and knowledge of the people (new or traditional / indigenous knowledge): what to do / use what / cultivation techniques to resist the above effects (note Indigenous varieties are short-term, drought-tolerant, diversify livelihoods (which are not currently cultivated) ... etc. Are the varieties disappeared / trend disappears, varieties have a tendency to develop?
5. Other difficulties, proposed solutions related to natural disasters (especially related to women).

Tool 4: Disaster impact assessment

After discussion, support the group of people / women to assess the impact of natural disasters by scoring from 1 to 5. 1) Very serious; 5) the least serious. Explain the reason for the score.

Type of disaster	Score	Reasons for the score

Tool 5. Seasonal livelihood calendar

Process

- Introduce objective, process and participants
- Facilitate discussion
- Fill information as the below table (use A0 paper)

LIVELIHOOD	% of women	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	Affected due to which hazard
Livelihood 1														
Livelihood 2														
Livelihood 3														
Livelihood 4														
Livelihood 5														

Discuss the following information areas, note the difficulties, impacts and solutions:

1. Type of production
2. Input: land, materials, seeds, labor etc.
3. Cultivation techniques
4. Irrigation

5. Products
6. Process of products
7. Market
8. Impact by different type of disasters (use the list as as the provious tools if needed).
9. Scoring the impact (1 is most serious).

Tool 6: Mobility calendar for women

Process

- Introduce objective, process and participants
- Facilitate discussion
- Fill information as the below table (use A0 paper)

Women activities	Location	Distance from the house	Duration	Frequency	% women in the village has this profile	Difficulties, causes and solution

Use the following suggested questions to gather more information:

- Activities may include
  - Family activities (cooking, childcare, taking children to school ... etc)
  - Production activities
  - Sell products, go to market
  - Meetings, training, capacity building
  - Entertainment…
  - Working outside the community ...
  - ... etc
- The reason women do these activities
- Means, tools, energy used
- Difficulties, desire to do differently, solutions ... etc.

Tool 7: Viable livelihood options

Process

- Introduce objective, process and participants
- Facilitate discussion to find out and list all livelihood activities (current and potential) especially related to:
  a) About existing women-based enterprises and women's existing livelihood activities; existing challenges.
  b) Potential enterprises and livelihood options where renewable energy can be used to augment women's economic opportunities

c) Potential enterprise development options with renewable energy (for example: selling of solar products, improved cookstove, etc.)

d) Potential women's groups /business women who can taken up the enterprises (potential women who would be interested to start this business)

- Scoring (5 is highest), find out reason, difficulties, causes and proposed solution

Livelihood options	Economic	Market	Social	Climate change respond	Energy use	Sustainability

More specific criteria below can used for facilitation

1. Economic aspect
Investment efficiency (without labor cost): Revenue/cost/year %, accounting for the first 5 years)
Fast capital turnover
Advantage of idle time
2. Market aspect
Easy to sell in local market
Low market risk (for example, in the long run, market might be not available or the current market is unstable)
Potential for value added in value chain
3. Social aspect
Suitable with poor households (e.g.: small production scale, small investment)
Women's interest and needs
Improving women's participation, social status and benefit, women empowerment
Techniques suitable with production capacity and culture of local people.
Not causing negative impact on children (such as attracting children labor leading to school drop-out etc.)
4. Environmental aspect
Reduction and/or limitation of pesticide, chemical fertilizer, application of sustainable pest management (IPM, VIETGAP)
Contributing to improve soil fertility (nitrogen fixing plant, cover crops, animal that has large amount of waste etc.)
Positive impact on environment such as forest, water source (increase forest coverage, biodiversity, water resources. Not create byproducts that damage environment etc.)
5. Climate resilience
Diversify production system (crop rotation, inter-crop system, diversified livelihood/ income etc.)
Using indigenous knowledge
Varieties and/or techniques that are drought and heat resilient
Varieties and/or techniques that reduce time of growth cycles or avoid extreme weather in important growth period.
Varieties and/or techniques that are resistant to diseases and pest.
Varieties and/or techniques that are resilient to hoar frost, and cold spell.
6. Energy solution
Current/potential for green energy
Positive impact on energy use/save energy
7. Sustainability aspect - Weight 1
Community can maintain after project life
Women can continue post project
Ability to replicate to other households, other location with similar conditions
Suitable with local plan and development policies

Discuss the following information areas, note the difficulties, impacts and solutions including energy use in each aspect:

1. Type of production
2. Input: land, materials, seeds, labor etc.
3. Cultivation techniques
4. Irrigation
5. Products
6. Process of products
7. Market
8. Impact by different type of disasters (use the list as as the provious tools if needed).
9. Scoring the impact (1 is most serious).

Important notes: Ask all questions about energy/facilities used, difficulties, solution/needs for all the process of production/setting up services/enterprise for women to find out:

a) About existing women based enterprises and women's existing livelihood activities; existing challenges.

b) Potential enterprises and livelihood options where renewable energy can be used to augment women's economic opportunities

c) Potential enterprise development options with renewable energy (for example: selling of solar products, improved cookstove, etc.)

d) Potential women's groups /business women who can taken up the enterprises (potential women who would be interested to start this business)

Tool 8: Interview representatives of women groups/enterprise

Use the information in the below table for semi-structure interview

Always collect information about:

- Skills/Traditional techniques apply
- Difficulties, causes, solution and capacity building needs
- Collect information regarding the working culture in the community, specifically within women. Find out if they work in a group, if there is any women's group or not. If yes, what are their main activities and if there is no group culture then what is the reason behind that.

Need specific collecting information to identify:

e) About existing women-based enterprises and women's existing livelihood activities; existing challenges.

f) Potential enterprises and livelihood options where renewable energy can be used to augment women's economic opportunities

g) Potential enterprise development options with renewable energy (for example: selling of solar products, improved cookstove, etc.)

h) Potential women's groups /business women who can take up the enterprises (potential women who would be interested to start this business)

Difficulties, causes, solution and capacity building needs.

No	Need of information	Remark
1	***General information***	
	Name of FO	
	Add	
	Phone number	

	Date of established	
	Type: Cooperative/ collaborative group/interested group/other	
	Number of board of management: - Women - Man	
	Number of members: - Women - Man	
	Area of operation: - Manufacture - Trading - Services - Other (detail)	
	Kind of business - Agriculture - Non-agriculture - Other	
	Main of product/services	
2	***Manufacturing and business***	
	Total of production area (for agriculture and livestock farm)	
	Technical/ high-tech application (detail)	
	Total turnover 2018	
	Net profit 2018	
	List of machine/equipment - Farm machinery - Processing - Other	
	Energy for manufacture and business - Power - Solar energy - From water (turbine) - Coal/wood - Gas - Other	Need to collect information on type, cost, installation time, difficulties, advantages and desire for alternative energy solutions. Other assessments on energy use patterns.
	Other energy can be using in the future	
	Risks encountered in production - What kind of risk (storm, rain, flash floods, landslide…)? - Period - Extent of damage (high, medium, low: explain)	
	Solution to risk management (explain)	

3	***Market situation***	
	Market: - At district - At province - Domestic - Export	
	Distribution channels: - Retail - Wholesale - Farming contract	
	Disadvantage/difficulties encountered in sale (explain)	
	Advantage in sale	
	Solution	
4	***Access to capital***	
	- Total of capital (vnd)	
	- Source of capital: contribution from member, loan from bank, sponsor… - Loan from bank: agriculture bank, Vietnam social policy bank, micro-finance…	
	- Advantage in access to capital (explain) - Disadvantage in access to capital (explain)	
	- Solution to access to capital	
5	**Group culture**	
	Volunteer? Self-help? how to meet, how to contribute capital, assets, frequency of meetings, sharing activities, mutual assistance (public exchange, joint work, etc.), other social activities ... etc.	

Will they be interested to start any new business? Related to RE? If yes- what kind of business ?

May be add few more questions to collect information related to point e to h

Tool 9: Individual interview

N.°	
Area/District	
Interviewer	
Date	_____/_____/____

Questionnaire
Household Production and Consumption
of Energy in _____

Part A: General Information

1. Information of the informant

Name: _____ Sex: ☐ Female ☐ Male

Age: ..... Tel.: .....

Type of HH

☐ Poor ☐ Near poor ☐ Female headed HH ☐ Others

The informant is:

☐ Male head of the family ☐ Housewife/Female head of the family ☐ Other

2. How many people are living in this household?	
How many living here are in the working age? (18-65 years old)	
How many of those in the working age are unemployed?	

3. What are the sources of income for this household? (Gross income of the whole family):

Fixed Salary		Mt/month		months/year
Daily wage		Mt/month		months/year
Merchandising of goods and services		Mt/month		months/year
Manufacturing		Mt/month		months/year
Crops		Mt/year		
Animal Husbandry and Fisheries		Mt/year		
Others (Specific items)		Mt/year		
Total income		VND/year		

(For salary, if you can't get the numbers, you can put it in a range.)

4. What are the *non-energy* expenses of your household in 2018? (i.e. *not* electricity, gasoline, diesel, LPG gas, kerosene, firewood, charcoal, etc.)

House rent		VND/month
Installments and interest (of debt)		VND/month
Food		VND/month
Wage (for helpers/maid, etc.)		VND/month
Factors/costs of production in **commerce and manufacturing** (stall rent, costs of goods/raw material etc.)		VND/month
Factors/costs of production in **agriculture and fisheries** (equipment rent, raw material, fertilizer etc.)		VND/year
Water supply		VND/month
Transportation fee (bus, train, etc.) – ***not** your own cars or motorbikes*		VND/year
School Fee		VND/year
Medicare		VND/year
Fee for family business (specifically funeral of one's parents and weddings)		VND/year
Buying furniture, housing appliances		VND/year
Others (clothes, etc. paid in cash)		VND/year

Part B: Potential Resources

5. Does your family do animal husbandry? If Yes, how many of the followings do you keep? Please put the numbers in the dotted lines after the "#" sign.

☐ Pigs	#.....
☐ Cattles	#.....
☐ Poultry	#.....
☐ Goat	#.....
☐ Sheep	#.....
☐ Rabit	#.....
☐ Aquaculture	#.....kg/year
☐ Others	#.....

6. If your family has crops, what do you grow?

No.	Type of trees	Area (M^2)	Productivity(kg/unit/year)
	Rice		
	Maize		
	potato		
	...		

7. Does your family produce wine?

☐ Yes. ☐ No.

If yes, how many litters does your family produce per month? And what kind of materials does your family using for wine producing?

8. On average, how many kilogam of waste does your family eliminated per day and per week? In which:

Organic waste is.....kg/week. It has been treated by:

Burn it making compost throw to other place be collected other

Inorrganic waste is.....kg/week. It has been treated by:

Burn it making compost throw to other place be collected other

May be some question related to fishing?

Do you collect forest produce ? may be some questions related to it ?

Part C: Household energy and fuel production

9. Do you collect, use or sell wood? Yes..... No....(If No move to next question)

If collecting wood, how long does it take each time? .....hour

times /week..... ..... week/month ..... month/year

How many kilogam of wood can you collect each time ? .....kg./time

From where? ☐ Plantation forest ☐ Nature forest ☐ others (specified).....

If you buy wood, how much does it cost? ..... VNĐ/k.g.

If you sell wood, how much does it cost per kg? ..... VNĐ/k.g.

In total, how many kg of wood does your family collect every month:		k.g./tháng
In total, how many kg of wood does your family buy every month:		k.g./tháng
In total, how many kg of wood does your family sell every month		k.g./tháng
In total, how many kg of wood does your family use every month		k.g./tháng

Why do you prefer wood rather than other fuels? ☐ Good fire ☐ easy access ☐ cheap ☐ others

Are there any issues while using wood? ☐ insufficient ☐ dirty ☐ others

10.Does your family use, sell or buy charcoal ?	☐ Yes.	☐ No. **(Move to next question)**

If buy, how much does it cost per/k.g.? ..... VNĐ/k.g.

If producing, where do you collect wood?

☐ buy from market ☐ Natural forest ☐ Plantation forest ☐ others.....

How do you make charcoal? ☐ open burning ☐ traditional stove ☐ improved stove ☐ other

How many kg of wood do you burn each time? .....k.g.

How many kg of charcoal do you got? .....k.g.

If selling charcoal, how much does it cost? ..... VNĐ/kg.

In total, how many charcoal do you produce:	k.g./month
In total, how many charcoal do you buy:	k.g./month
In total, how many charcoal do you sell:	k.g./month
In total, how many charcoal do you consume:	k.g./month

11. How many kg of wood did you collect from your garden in the last year

.....kg

How many per time.....Kg.

10. Does your family have solar water heater :
The capacity of system area of the system

11. Does your family have oil of gasoline *power generators* in use? ☐ Yes. ☐ No.

No.	Capacity	Operation time			Type of fuel
1.	.....kW	.....Hours/Day	.....Days/Month	.....Months/Year	☐gasoline ☐diesel
2.	.....kW	.....Hours/Day	.....Days/Month	.....Months/Year	☐gasoline ☐diesel
3.	.....kW	.....Hours/Day	.....Days/Month	.....Months/Year	☐gasoline ☐diesel

Approximate ***gasoline*** used for the generators in total	.....Litres/Year
Approximate ***diesel*** used for the generators in total	.....Litres/Year

12. Does your family have *solar panels* in use? Solar cell ☐ Yes. ☐ No. **(Go to 11.)**

Capacity	How many?
W	Panels
W	Panels
W	Panels
W	Panels

13. Does your family have *biogas digesters* in use? ☐ Yes. ☐ No.

No.	Capacity	Type
1.	m^3	Dome
2.	m^3	Plastic
		Other

14. Any other energy/fuel conversion/production processes, (e.g. hydro/wind turbines, water/wind mills, biodiesel, ethanol, etc.)?
Please describe in the box below. (Capacity, operation pattern, etc.)

Part D: Household Energy Consumption

I. Electricity

15. Does your area have access to the national grid?	☐ Yes.	☐ No.
16. Does your family have electricity? (from village grid or your own generation etc.)	☐ Yes.	☐ No.
17. Is your house connected to the grid?	☐ Yes.	☐ No.
18. Why not?	☐ Expensive ☐ No use ☐ Not eligible ☐ Own generation ☐ other	
19. Do you want to have electricity?	☐ Yes. How much can you afford to pay? .....Mt/month	☐ No.

20. What power supply problems do you often have?

☐ stable	☐ Blackouts	Blackouts for repair and maintain Blackouts for breakdown Blackouts for other reason

21. Do you have complete electricity bills/receipts of the last a few months or less? What are the details?

Month	Total electricity cost (Mt/Month)	Total Use (kWh/month)
1.		
2.		
3.		
4.		
5.		
Total electricitical cost	VNĐ/year	

22. If you do not have the bills/receipt, or if your bills/receipts are not complete for one month, how much does your household pay for electricity?

On average, the family pays about.....Mt/month for electricity.

II. Energy Consumption for Lighting

23. What lighting equipment does your house regularly use? How many each?
Please put the numbers after the '#' sign.

☐ inclandescent bulb #.....bulb(s)
☐ fluorescent bulb #.....bulb(s)
☐ compact bulb #.....bulb(s)
☐ solar lantern #.....lantern(s)
☐ battery lantern #.....lantern(s)
☐ kerosene lantern #.....lantern(s)
☐ gas lamp
☐ candle
☐ other.....

How many hours per day do you usually need lighting? ..... hours/day

24. According to Question 23., if you use kerosene lamp, how much kerosene does your family use? It equivalent to .....VNĐ/month

III. Energy Consumption for Cooking

25. What kinds of stoves/ovens does your house use for cooking?

☐ electric stove/oven ☐ traditional coal stove ☐ wood stove
☐ gas stove/oven ☐ improved coal stove ☐ 3-stone/ open fire
☐ Rice husk stove ☐ other .....

26. What kinds of traditional fuel does your house use for cooking?

☐ Firewood		k.g./month	*(For cooking only)*			
☐ Charcoal		k.g./month				
☐ Rice husk		k.g./day		Days/Month		Months/Year
☐ Corn cops		k.g./day		Days/Month		Months/Year
☐ Others (cassava stalks, leaves, straw, saw dust, etc.)		k.g./day		Days/Month		Months/Year

(If the quantity is very small, put "0", no need to estimate.)

27. Does your house use the followings and/or other *electric* appliances for cooking? How often?

Electric Cooking Appliances	Watt	Quantity	How much are they used?		
			Hours/Day	Days/Month	Months/year
Rice cooker					
Electric or microwave oven					
Toaster					
Electric kettle					
Outro.....					
Outro					
Outro					

28. If your family use gas stove/oven, how much gas do you use?

Your family use about .....tanks of gas per year. On average each tank costs .....Mt/tank, and one tank contains ..... k.g. of gas.

If you use gas for cooking, is gas available in your community? ☐ Yes. ☐ No.

29. Does your family use biogas for cooking?

☐ Yes. ☐ No. If have, how much time does your family use per day.....per month.....per year?

Any energy consumption for drying? May include questions related to that.

IV. Energy Consumption for Transport

30. What kinds of vehicles does your household have for transportation? And how many each?
Please put the numbers after the '#' sign.

☐ Bicycle(s) #..... ☐ Car (s) #..... ☐ Boat(s) #.....

☐ Motorcycle(s)#..... ☐ Electrical Bicycle #..... ☐ Other .....[Specify]

31. If your family have electrical bicycle? How much capacity does accumulators have?.....How often do you charge for the accumulators?

32. If your household has *motorcycle*(s), how much is being spent on *gasoline* for them?

In **total** your family spends approximately ..... lit/month on gasoline for them. Equal to .....VNĐ/month

How much of the gasoline for the motorcycle(s) is bought from **inside** of your community? ..... lits/month

33. Does your family have car?(s), how much is being spent on *gasoline or oil* for them?

In **total** your family spend approximately ..... lit/month on gasoline/oil for them. Equal to.....VNĐ/month.

How much of the gasoline/oil for the car(s) is bought from inside of your community? ..... lits/month

34. If your household has *boat*(s), how much is being spent on *diesel* for each of them?

And in **total** your family spend approximately ..... lits/month on diesel for them. Equal to.....VNĐ/month

How much of the diesel for the boat(s) is bought from **inside** of your community? ..... lits/month

V. Household Energy Consupmtion for Agriculture

35. Does your household have the following machines for agriculture? How much do you use them?

Diesel Machines	Watt	Quantity	Diesel Consumption	
			Litres/year	Mt/year
tractor(s)/plower(s)				
agri. water pump(s)				
diesel grain mill(s)				
other.....				

Electric Machines	Watt	How many units?	How much do you use them?		
			Hours/Day	Days/Month	Month/Year
agri. Water pump(s) (1HP = 746 watt)					
milking machine					
electric grain mill(s)					
other..... (requirement of any agriprocessing machine)					

Energy consumption for fishing?

Energy consumption for drinking water?

Energy consumption for any other livelihood options?

VI. Household Energy Consumption for Other Uses

36. Does your house have any of the following appliances?

Name of Appliance	Quantity	How much do you use them?
☐ electric water heater		.....W.....hours/day.....day/month.....month/year
☐ television		
☐ radio		
☐ CD/DVD/VDO player		
☐ electric fan		
☐ electric iron		
☐ charcoal iron		
☐ mobile phone		
☐ refrigerator/freezer		
☐ air-condition		
☐ sewing machine		
☐ washing machine		
☐ computor		
☐ vacumn cleaner		
☐ hair dryer		
☐ domestic electric water pump		
☐ other		

37. If your family doesn't have electric water heaters, which following appliances do you use for boiling water? how much do you use them?

Gas stove coal stove solar water heater wood stove other

Which months do you use heat water for taking a bath?

From.....to.....equivalent to.....month/year.

How many litters of heat water does your family used for bath per day?.....lits/day

E. Credit

Information need to be collect	Remarks
Current loan amount and related information such as interest rate, term, bank, etc.	
The person who decides to borrow money and has a loan name in the family	Man or women
Ability, desire to borrow more	
Difficulties in borrowing / repaying capital	

F. Other question

38. Do you plan to buy more electrical appliances and vehicles next five years?

Please specific:

39. Have you got any waste collecting units/company in your commune?

If have, how often do they collect per week.....time/week

40. Does your family have any dry appliances for agriculture?
If have, how often do you use for this case?

Date and time.....

Signature of interviewee

Annex 5. EmPower's Shortlisting Criteria for Selecting the RE-based Enterprise and Entrepreneurial Women Group

SHORTLISTING CRITERIA

For selecting the enterprise and entrepreneurial women groupfor Renewable energy and climate resilient livelihood

Parimita Mohanty, Annette Wallgren
UN Environment, Asia and The Pacific Office

Background:

This document contains the shortlisting criteria to be considered for selecting enterprise/s and women entrepreneurial groups (identified during the scoping studies) related to Renewable Energy, women entrepreneurship and climate resilience activities under EmPower project. Under this project, Renewable Energy (RE) will be used as a tool for climate resilient action and women entrepreneurship development. Here RE will be used for two options

a. FOR enterprise development, where women groups will run different enterprises linked to climate resilience action and RE is used to meet their critical energy requirement
b. AS enterprise, where the individual woman or women group can create enterprise to sell the RE products and services

The following sections will discuss the shortlisting criteria for each of the option separately. Based on these criteria, a ranking and marking system can be developed to filter out the most appropriate enterprises and women groups and individual woman which can be considered further.

RE is used FOR enterprise (select three such options per country)

Criteria for enterprise

1. Existing enterprise or a new enterprise? (will select one or two new enterprise and one or two existing enterprises)
2. Is this enterprise promoting local skills and knowledge?
3. Enterprise is linked to which sector?

    a. Agriculture and extended activities
    b. Horticulture
    c. Fishing
    d. Handicraft
    e. Any other

4. Perceived market potential: What is the market potential (in next 5 years) for the end product of the enterprise, where RE is used as a source of energy?

    a. Scope for local market
    b. Market scope in the provinces
    c. Market scope for the country

5. Is there any market linkages already established for the end product? Or it's a completely new product? (better if market linkages exist)

6. Extend of benefits of RE when used as a source of energy in particular enterprise (Greater %, better)

    a. Increase in material output (%)
    b. Increase in income (%)
    c. Time saved (%)
    d. Reduction of drudgery (%)
    e. Others

7. Extend of benefits to climate change (Tick the options)

    a. Help reducing the GHG emission
    b. Help running the enterprise even during and after climate disaster
    c. Help in increasing the quality of the end-product, which was otherwise hampered due to CC impact
    d. Any other

8. What is the estimated cost in establishing the enterprise and how many women entrepreneurs in the group to be benefitted?

Criteria for Women group interested in each enterprise

9. Women Group already formed and operated to run such enterprise?

    a. Women Group legally formed and active (Best option)
    b. Women Group legally formed, but not active (Medium option)
    c. Women Group informally formed (Medium option)
    d. Women Group yet to form (lower medium option)
    e. Any other

10. Existing average income level of the women in the group?
11. Women in the group has experience of working in any enterprise. (YES/NO)
12. Women in the group has some experience of making business. (YES/NO)
13. Women in the group are proactive, has basic skills and business acumen?
14. Women has operating access to banks and FI?
15. Women group has time and willingness to run the business?

    a. More than 75%
    b. 50-75%
    c. 25-50%
    d. Less than 25%

16. Are they aware of climate change impact and various related government activities in their locality?

RE is used AS enterprise (select three such options per country)

Criteria for enterprise

1. Perceived market potential (in next 5 years) for selling of various RE products and services (estimate the below scope/potential for each of the RE products and services)?

    a. Scope for local market
    b. Market scope in the provinces
    c. Market scope for the country

2. Presence of existing similar RE enterprise?
3. Possibility of linking it to established RE suppliers

    a. As dealer
    b. As technical support/sales agent
    c. Others

4. Any governmental/similar scheme for promoting any specific RE products and services. If yes, name the scheme and the products considered within the scheme?
5. What is the estimated cost in establishing the enterprise and what is the population coverage?

Criteria for individual woman or Women group interested in each enterprise

6. Interest and knowledge of woman/women group on RE?
7. What extent women are known to the community and her/their relationship and coverage within the community?
8. Basic educational qualification?
9. Operating access to Bank and FI?
10. Any experience of running any business?
11. Existing financial background to run such business?
12. Any restriction on her mobility?
13. Business acumen and marketing skill?

----- End of the document -----

References

AIM RVR AFCSR. (2016, February 10). Asian CSR Awards 2015 Winner-Lighting a Million Lives [Video file] https://www.youtube.com/watch?v=5BX8Z8q42LM

BC Campus. (n.d.) Business Model Canvas. https://opentextbc.ca/organizationalbehavioropenstax/chapter/business-model-canvas/

Benoo. (2021). www.benoo.africa

Cecelski, E., & Dutta, S. (2011). Mainstreaming gender in energy projects. https://ppp.worldbank.org/public-private-partnership/sites/ppp.worldbank.org/files/documents/Energia_Mainstreaming_gender_in_energy_projects_A_practical_Hand_book.pdf

Dutta, S. (2018). Supporting last-mile women energy entrepreneurs: What works and what does not. https://www.energia.org/assets/2019/01/Supporting-Last-Mile-Women-Entrepreneurs.pdf

Energia. (2016). Practical action: Women in energy enterprises in Kenya. https://www.energia.org/practical-action-women-in-energy-enterprises-in-kenya/

Energy 4 Impact. (2017). Empowered women securing energy access in rural Senegal. https://energy4impact.org/news/empowered-women-securing-energy-access-rural-senegal

Foundation for Innovation and Social Entrepreneurship. (2021). Social Alpha. https://www.socialalpha.org/

Govindan, M., Murali, R., & Dholakia, D. (2019). Women in energy: Breaking stereotypes and inspiring change. https://www.developmentaid.org/api/frontend/cms/file/2020/02/women_in_energy_breaking_stereotypes_and_inspiring_change.pdf

Habtezion, S. (2016). Overview of linkages between gender and climate change. https://reliefweb.int/sites/reliefweb.int/files/resources/UNDP%20Linkages%20Gender%20and%20CC%20Policy%20Brief%201-WEB.pdf

Hemson, D., & Peek, N. (2014). Integrating women into Grameen Shakti's renewable energy value chain in Bangladesh. https://www.energia.org/assets/2017/01/2014-Bangladesh-IntegratingWomenRenewableValueChain.pdf

Kopernik. (2021). Our work. https://kopernik.info/en/

McCarthy, J. (2020). Understanding Why Climate Change Impacts Women More Than Men. https://www.globalcitizen.org/en/content/how-climate-change-affects-women/

Nexus for Development. (2021.) EmPower Women for Climate Resilient Societies. https://nexusfordevelopment.org/project/empower-women-for-climate-resilient-societies/

Phone World. (2015). Ufone and Buksh Foundation starts 'Lighting a Million Lives' campaign. https://www.phoneworld.com.pk/ufone-and-buksh-foundation-starts-lighting-a-million-lives-campaign/

References

Pueyo, A., & Maestre, M. (2020). IDS Bulletin Volume 51. https://www.icrw.org/wp-content/uploads/2020/02/IDS-Bulletin-Gender-and-Energy-Opportunities-for-All.pdf

REEP. (n.d.). Innovative clean energy finance for Cambodian farmers: Nexus. https://www.reeep.org/projects/innovative-clean-energy-finance-cambodian-farmers-nexus

The Energy Institute. (2021). Energy access. https://www.teriin.org/energy-access

Vietnam Bank for Social Policies. (2019). Mobile banking – financial inclusion and economic empowerment for low income people and women in Vietnam. http://thebpp.com.au/wp-content/uploads/2019/01/Press-release-_Phase-Two-Launch-06.9.2019.pdf

Scott Wilson Nepal. (n.d.). Final evaluation study of promoting women-led enterprises for energy access and local production (WEE-Nepal). https://swnepal.com.np/project/final-evaluation-study-of-promoting-women-led-enterprises-for-energy-access-and-local-production-wee-nepal/

Solar Sister. (2018). What we do. Retrieved from https://solarsister.org/what-we-do/

UN Environment Programme & UN Women. (2019). About Us. https://www.empowerforclimate.org/en/about-us

UN Environment Programme & UN Women. (2019). Bangladesh. https://www.empowerforclimate.org/en/where-we-work/bangladesh

UN Environment Programme & UN Women. (2019). Cambodia. https://www.empowerforclimate.org/en/where-we-work/cambodia

UN Environment Programme & UN Women. (2019). Viet Nam. https://www.empowerforclimate.org/en/where-we-work/vietnam