



A POWERING AGRICULTURE GUIDE ON INTEGRATING GENDER IN THE DEPLOYMENT OF CLEAN ENERGY SOLUTIONS FOR AGRICULTURE



WHAT IS THE PURPOSE FOR THIS GUIDE?

As an innovator, you strive on a daily basis to create a clean energy solution (CES) that serves the needs of a wide customer base. The broader the appeal of your CES, the more likely that it will reach scale. This guide will help you incorporate gender considerations into the product development, field testing, and commercialization of your CES to broaden its appeal to both female and male customers, users, and beneficiaries. The insights contained in this document will help you unlock the potential demand for your CES among women farmers in particular, who have been under-targeted and underserved. It will also provide best practices on how to integrate gender at all levels: individual women and men, communities where CES is adapted, and within CES company/organization management and staffing. At the end of this document you will find a practical checklist that can help you in developing a gender-responsive strategy to increase the sales of your CES technology to both female and male clients.

WHY SHOULD YOU CARE ABOUT FEMALE CUSTOMERS?



1. It makes **business sense** to invest in developing products and services that are attractive and accessible to a broader market of both female and male users, and to build diverse technical, management, and sales teams. Women in fact may prove to be the primary market for your CES because a) it will alleviate responsibilities that are primarily undertaken by them, and b) in some cultures women are the ultimate decision makers regarding investment decisions at the household level. Without building gender considerations into the CES early on, you risk missing out on the full potential of this market segment.



2. It makes **financial sense** if you plan to raise capital from social impact investors or international development sources. Many investors will not invest unless gender equality is an explicit outcome with meaningful activities designed to achieve it. Virtually all donor-funded credit lines and financing facilities are explicitly committed to gender mainstreaming in their lending and investment decisions.



3. It is the right thing to do, especially for mission-driven entrepreneurs and their supporters. In addition to commercial gains, **gender equality matters**. CES, particularly those intended for use by small farmers, can have significant impact on reducing women's labor burden and positively transform the way in which women and men work and live together—both within communities and within companies. It can also be a key contributing factor to food security (Sida 2015).

WHAT ARE THE CHALLENGES TO PROVIDING GENDER-RESPONSIVE CES TECHNOLOGIES?

As a first step, it is important to understand common barriers which may limit women's access to, use of, and benefits from your innovation. Common gender-related challenges include the following (FAO 2015):



Time. Due to multiple responsibilities with productive and caregiving work, women have less time to participate in training, marketing events, and product demonstrations than do men. Women in conservative societies may not be allowed to participate in public events, as they are expected to spend their time exclusively on caring for their home or may not be allowed to be in the presence of men outside of their family (FAO 2015). The FAO found that in Asia and Africa women work as much as 13 hours more than men per week, and on average, rural women and girls spend almost an hour each day gathering fuel and carrying water needed to prepare meals (FAO 2011). Time-use surveys across a wide range of countries estimate that women provide 85-90 percent of the time spent on household food preparation and that they are also usually responsible for child care and other household chores; the combined time burden of household chores and farm work is particularly severe for women in Africa (FAO 2011). On average, women carry out at least two and a half times more unpaid household and care work than men in countries where the relevant data are available. Women (either in self-employment or wage and salaried employment) have longer working days on average than employed men, with a gender gap of 73 minutes per day in developing countries, and even when women are employed, they still carry out

the larger share of unpaid household and care work, which limits their capacity to increase their hours in formal wage and salaried work (ILO 2016).



Roles in decision-making, particularly in relation to purchases.

In many cultures, women have less decision-making power and space to voice their opinions within their homes and communities due to traditional power imbalances. As a result, women's technological needs may go unheard without an extra effort to hear and understand them. Women's culturally-defined roles revolve around listening, caring, and supporting, while men's are speaking, directing, and deciding (Feed the Future, 2014).

The Women's Empowerment in Agriculture Index measures women's relative power to men in decision-making roles at home, in agricultural production, with productive resources, and within community structures. In a baseline report of various measures across 13 countries, Feed the Future found that: *"Across the majority of countries and regions, the greatest constraints on empowerment among women in agriculture are a lack of access to credit and the power to make credit-related decisions; excessive workloads; and a low prevalence of group membership. Second, in comparing men's and women's empowerment scores across countries, on average women are twice as disempowered as men ...in their ability to access and make decisions regarding credit, and over one and a half times as disempowered with respect to workload and group membership."*

(Feed the Future 2014)



Access to resources. Women have less access to productive resources such as agricultural inputs, property/land ownership, and financial products. For example, women represent fewer than 5 percent of all agricultural holders in the countries in North Africa and West Asia for which data are available, and in

sub-Saharan Africa the average is 15 percent (FAO 2011). Women face additional barriers to accessing these resources such as: requirements for extra collateral for a loan; discrimination by loan officers; requirement for husband's formal approval; lack of legal land ownership for collateral for a loan or to participate in a farm cooperative; and lack of bank account.

Across agricultural sectors, women farmers receive only about 5 percent of agricultural extension services and only 15 percent of extension workers globally are women (FAO 2011). A 2010 World Bank study found that extension agents only serve 2 to 20 percent of women farmers in Ghana, India, and Ethiopia (FAO 2015). Thus, women are often excluded from opportunities to gain knowledge, participate in pilot programs for new programs and services, and develop business relationships.



Value of their input/labor: Women's time and labor is often valued less than men's, resulting in fewer commercial solutions that address women's specific needs (Doss 2011). *"Women's work is often informal, unpaid, and focused on subsistence crops. Across the world, the vast majority of unpaid household and care work (including collecting firewood and fuel, fetching water, cooking, cleaning, and child care) is performed by women. As a result, when all activities, whether paid or not, are taken into account, women's working days become longer than men's."* (ILO 2016).

Women remain overrepresented as informal workers, and in 2015 a total of 586 million women fell in this category. In sub-Saharan Africa and in Southern Asia, a high proportion of women work as contributing family workers (34.9 percent and 31.8 percent of all working women, respectively) or as own-account workers (42.5 percent and 47.7 percent of all working women, respectively). In Southern Asia and sub-Saharan Africa, over 60 percent of

all working women remain in agriculture, often concentrated in time and labor-intensive activities, which are unpaid or poorly remunerated. In most countries and in keeping with global figures, women in rural areas who work for wages are more likely than men to hold seasonal, part-time and low wage jobs. Controlling for education, age and industry, women receive lower wages for the same work. In most developing countries, a relatively small share of the population works for a wage, and women are less likely to do so than men (ILO 2016).

For example:

- 15 percent of men but fewer than 4 percent of women are employed for wages in Ghana.
- In Bangladesh, 24 percent of rural men and only 3 percent of rural women work in wage employment.
- In Ecuador, almost 30 percent of rural men and only 9 percent of rural women receive a wage. (FAO 2011)

Because of this skewed valuation of input/labor, technological innovation often focuses on applications that reduce men's labor or increase men's productivity.



Unintended hardship for women.

On the one hand, new agricultural technologies can unintentionally result in increasing women's unpaid work (IFAD). Studies and examples globally are numerous. Some include documentation of increased travel time or increased chores for women as a result of technology introduction. For example:

- Donkey carts distributed to men in South Africa were used to collect and sell wood closest to the homestead, leaving women to travel even further to get domestic fuelwood (FAO 2015).

A livestock irrigation project to increase crop residue and available drinking water for animals resulted in greater income, increased market activities, and more milk consumed by children. However, reduced grazing practices required women and girls to spend more time feeding the animals. Several households decided to implement the even more labor-intensive practice of stall feeding. Women ended up taking on greater roles as laborers and family workers, so the net result of the project was to increase women's work (FAO 2015).

On the other hand, CES technologies may unintentionally result in job loss and reduced income for women if they replace the need for manual labor, often performed by women, with no alternative livelihood options. There are numerous studies globally on shifts in power over agricultural production as a result of technology introduction. Some examples include (IFAD):

- In many places globally, women use "leftover" agricultural products to sell in local markets. For example, in Nicaragua women use leftover milk to make artisanal cheeses to sell informally. Introducing cold storage for dairy results in less leftover milk and may reduce women's control over the product and shift earnings to men.
- In Nigeria, a mechanized grater reduces the time required to grate garri from one day to 15 minutes but women cannot afford to own graters and have therefore lost control over profits from grating.
- In West Africa, an improved smoking oven reduced the time women needed for fish processing by 60 percent, but since profitability improved, men have taken over fish smoking from women.



Absence of women in scientific and technical fields.

Globally, women occupy around 19 percent of all ministerial posts, but only 7 percent of these are in environment, natural resources and energy, and a mere 3 percent are in science and technology (UNIDO 2014). Worldwide, women account for only 9 percent of the construction workforce and make up only 12 percent of engineers (UNIDO 2014). As a result, policy makers and private sector leaders are often unaware of women's energy demands, and less attention is paid to technology development and investments aimed at improving women's work in comparison to men's (UNIDO 2014).

Women are less likely to enter technical and scientific fields due to: expectations of "appropriate" women's work; judgments about skill and ability; discouragement of girls to pursue technical education and careers; and hostile or discriminatory work environments (UNIDO 2014). As a result, fewer female engineers are involved in product development; fewer female agronomists are involved in piloting and training; and fewer females are involved in sales and marketing—which all reinforce the challenges to CES uptake mentioned above.

WHAT ARE THE SOLUTIONS TO INTEGRATE GENDER EQUALITY GOALS AND ACTIVITIES IN CES TECHNOLOGY DEVELOPMENT?

Here are questions that can help guide you to incorporate internationally-recognized best practices:

What are you doing to identify the potential impacts of CES on users – women and men – during concept development and market research?

How is gender analysis being used in your product development?

- Work with potential male and female users to identify how the CES could be used or adapted, and how it changes the way people work and relate to one another.
- Identify potential impacts on decision-making within households, and expectations for labor and time inputs.
- Ensure that a new technology will result in a net gain for women through decreased labor burden, increased income, or empowerment.
- Look for opportunities beyond a single use of the CES to numerous income-generating activities. For example, PV technologies that store and generate energy for activities beyond irrigation – such as for cooling and lighting – can expand women's entrepreneurial options and improve their standard of living.

You may consult the Powering Agriculture Guide on Integrating Gender in Product Development for more insights on issues relating to this area.

How can you introduce flexible selection criteria into your pilot/prototyping process? What exclusionary criteria might you change?

- Identify exclusionary criteria that limit women's access to business partnerships, training, financing, and piloting. These criteria often include having a bank account or possessing legal land title.
- Identify appropriate mitigating measures. Such measures could include: relaxing land ownership requirements; offering the opportunity to numerous farmers to pool together and qualify as a group rather than individual; allowing farmers to apply as a cooperative; and partnering with a financial institution to assist potential CES users to open a bank account with regular "bank account fair days."

Are you facilitating access to inclusive financial products? If not, is this something you can include in your business plan?

- Work with male and female farmers during concept development and market research to determine at what level a technology becomes cost-prohibitive and will require external financing—and if that threshold varies across women and men.
- Identify linkages to local financial products that have flexible criteria and payment plans with reasonable interest rates, female loan officers, and “add-on” products attractive to women. If such products do not exist where you operate, then explore possibilities for in-house financing mechanisms, such as pay-as-you-go products.
- Seek linkages with village savings and loans associations and cooperatives, which are known to improve women’s access to knowledge, technical support, financial services, marketing information, and control over income they generate.

You may consult the Powering Agriculture Guide on Integrating Gender in the Financing of Clean Energy Solutions for more insights on issues relating to this area.

How are you working with/around women’s time constraints?

- Try to understand the challenges that limit women’s ability to participate in market research, pilots, and marketing events. Limitations often include inability to attend a demonstration event in the evening when women are responsible for cooking a family dinner, and lack of community acceptance for women to attend a gathering mixed with men.
- Work with the community to identify onsite child care arrangements to allow women to attend, or incorporate house-to-house visits.

Have you planned for/included gender inclusive training and technical support during product piloting?

- Work cooperatively with ministries of agriculture and organizations providing extension work to leverage existing efforts targeting female farmers.
- Work with farm managers to identify female and male laborers to include in technology trainings, mentorship, vocational training, business skills and financial literacy training, and more. This will support and equip female and male laborers equitably with the skills and knowledge they will need for advancement within their work and lives, while making the overall agribusiness a more attractive place of employment, and hence more productive.

How are you including men in the process?

- Understand the dynamics between women and men at home, within communities, and at work. Men are often community and household gatekeepers with significant decision-making power.
- Identify male champions willing to advocate for women to adopt technology and foster a supportive community environment for women.
- Identify equitable male and female role models in demonstration plots to provide a positive working example of how gender equality works.
- Hold forums where respected male leaders promote women and support them in voicing their concerns.

Are you hiring and promoting women in technical/ leadership roles within your company and in the communities where you are working? If not, do you plan to do so, or have you thought about how you could make this part of your strategy?

- Engage both women and men on design teams to maximize the user friendliness of the CES, thereby maximizing potential adoption and

use. More female representation in technical positions within an organization or a company will improve perceptions of technology accessibility and increase adoption by female farmers.

- Recruit women into male-dominated technical and managerial roles by liaising with relevant professional organizations, universities, and technical training schools to identify qualified female applicants; setting quotas; and supporting girls to enter STEM fields.
- Work towards fostering a supportive environment by making and adhering to equitable and family-friendly human resource policies (e.g., zero tolerance of sexual harassment, pay equity, maternity/paternity leave, flexible scheduling, etc.); linking women and men to NGOs that provide additional valued social services (e.g., health and education); and encouraging male and female managers to demonstrate their support for female employees in technical positions to send a message that women are valued and respected.

How are you measuring impact on women who are using and/or benefit from your CES?

- Set a learning agenda that measures meaningful change. Measuring basic indicators such as the number of women and men that attend training sessions or marketing events is an essential first step, but is not sufficient. Important questions for data to answer include: Are women interested in trying it? Are they able to purchase it? Why or why not? Who is using it on a regular basis, and what are the effects on that person's time, labor, or money? What is being done by women and men with saved time, labor, or money? Is it helping the family or not? What is the big picture of the impact of this CES on men and women?

You may consult the Powering Agriculture Guide on Integrating Gender into Monitoring and Evaluation of Clean Energy Solutions for more insights on issues relating to this area.

GENDER RESPONSIVE GUIDANCE ACROSS TECHNOLOGY INNOVATION PHASES

<p>1</p> <p>CONCEPT DEVELOPMENT</p>	<ul style="list-style-type: none"> • How does your analysis consider the different problems faced by women v. men? How does your CES address these specific problems? • Are you taking into consideration gender-specific preferences (size, weight, ease of use) in your technology design? • Does your proposed CES reduce women's labor or time burden, as it relates to the specific value chain? • Do value chain analyses accurately identify the role of men and women in the process and how they would benefit from the CES? • Have you involved both men and women from your organization in concept development? What input do they have over design and research with potential end users?
<p>2</p> <p>RESEARCH & DEVELOPMENT</p>	<ul style="list-style-type: none"> • What efforts have you made to recruit local women and men in technical roles (engineer, technician, manager) for R&D, prototyping and equipment fabrication? • Are you making efforts to identify local materials and supplies, from both male- and female-owned businesses and sources? Are you also considering equitable work environments in your sourcing decisions?
<p>3</p> <p>INITIAL PILOTING</p>	<ul style="list-style-type: none"> • Have you identified gender-based barriers to access (legal, financial, start-up capital, land ownership, cultural, religious, education, training, time)? Are you testing solutions to those barriers? If yes, what are they? • Are you including male and female stakeholders in consultations about adaptation of the CES? Are you including stakeholders and influencers that will support women's uptake of the technology and help to foster a supportive environment for female farmers, entrepreneurs, and workers? How are you doing this? • Have you engaged male and female agronomists/technicians for specific value chains to work with men and women to improve the adoption of the CES? • Are you collecting quantitative and qualitative data about the CES—challenges, effects on male and female users and beneficiaries in the same household/community/workplace? Does this go beyond counting attendance at trainings and events? • Are you measuring individual changes – at both the male and female level –as a result of using the CES? This can include food consumption, time savings/use, decision making, income, savings/expenditure/ investment, and wellbeing/happiness.
<p>4</p> <p>EARLY ADOPTION/ DISTRIBUTION</p>	<ul style="list-style-type: none"> • Are your demonstration plots and/or events strategically selected/located to include/attract a representative mix of users? This includes male/female heads of households/farms/worker/engineers, as well as cooperative male/female couples. • Have you engaged women in equal numbers to men for distribution of the CES and supplies? Are women serving as mentors, salespeople, etc., along with men? • Have your local training efforts included men and women equally for CES fabrication, installation, and maintenance? Are your contracts with suppliers promoting business opportunities to both male and female entrepreneurs? • How are you making equitable financing available to men and women for purchase of the CES? Have you made efforts to remove or mitigate any barriers/constraints (e.g., collateral, flexible payment options, etc.)? • Have you established a mentorship system for females to ensure a support network exists? This system can include, or be specific to, farmers/entrepreneurs/workers in order to provide support in business, scale-up, and at work.
<p>5</p> <p>MARKET GROWTH</p>	<ul style="list-style-type: none"> • Does your marketing strategy engage men and women equally in direct sales/marketing of the CES? • Does your marketing approach include tailored strategies (messages, medium, approach, social networking) for both men and women? Have these strategies been tested through sex-disaggregated focus groups or other means of discussion?
<p>6</p> <p>WIDE-SCALE ADOPTION</p>	<ul style="list-style-type: none"> • Have you found linkages with specific benefits or services (health, life skills, education, anti-gender-based violence, and other services) being provided to end users as both a marketing strategy and strategy to ensure healthy, productive customers who pay back loans? • Have you been successful in your efforts to remove gender-based constraints (financial, cultural, training for household decision-makers) to purchase of the CES? • Is your CES being locally fabricated, installed, and maintained by equitable numbers of men and women?

SOURCES AND ADDITIONAL RESOURCES:

Sida (2015). Gender Equality Tool Box Brief: Women and Food Security. Available at: <http://www.sida.se/contentassets/3a820dbd152f4fca98bacde8a8101e15/women-and-food-security.pdf>

World Bank (2009). Gender in Agriculture Sourcebook. Module on Gender and Food Security. Available at: <http://siteresources.worldbank.org/INTGENAGRLIVSOUBOOK/Resources/Module1.pdf>

FAO (2015). Running out of time: The reduction of women's work burden in agricultural production. Available at: <http://www.fao.org/3/a-i4741e.pdf>

FAO (2011). The State of Food and Agriculture. Women in Agriculture: Closing the gender gap for development. Available at: <http://www.fao.org/docrep/013/i2050e/i2050e.pdf>

FAO World Food Summit (2011). Women, Food Security, and Agriculture. Available at: <http://www.fao.org/worldfoodsummit/english/fsheets/women.pdf>

ILO (2016). Women at Work. Available at: http://www.ilo.org/wcmsp5/groups/public/--dgreports/--dcomm/--publ/documents/publication/wcms_457317.pdf

Feed the Future (2014). Measuring Progress Toward Empowerment. Women's Empowerment in Agriculture Index Baseline Report. Available at: https://feedthefuture.gov/sites/default/files/resource/files/ftf_progress_weai_baselinereport_may2014.pdf

Women's Empowerment in Agriculture Index. Available at: <https://feedthefuture.gov/lp/womens-empowerment-agriculture-index>

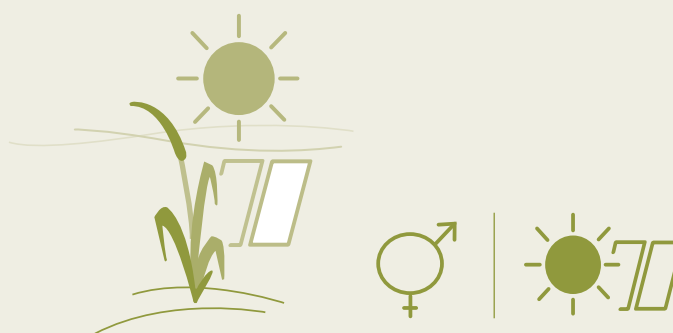
IFAD. Investing in Women as Driver's of Economic Growth. Available at: <https://www.ifad.org/documents/10180/8b9edb41-bef6-4e6d-a487-01a0286972e3>

UNIDO (2014). Guide on Gender Mainstreaming Energy and Climate Change Projects. Available at: https://www.unido.org/fileadmin/user_media_upgrade/What_we_do/Topics/Women_and_Youth/Guide_on_Gender_Mainstreaming_ECC.pdf

Doss, Cheryl R. "Designing agricultural technology for African women farmers: Lessons from 25 years of experience." World development 29.12 (2001): 2075-2092.

POWERING AGRICULTURE:

AN ENERGY GRAND CHALLENGE FOR DEVELOPMENT



This product was made possible through the support of the Powering Agriculture: An Energy Grand Challenge for Development Partners, which comprise the United States Agency for International Development (USAID), the Swedish Government, the German Federal Ministry for Economic Cooperation and Development (BMZ), Duke Energy, and the Overseas Private Investment Corporation (OPIC).

Further information about Powering Agriculture can be found at PoweringAg.org

