



# Opening Opportunities, Closing Gaps

**ADVANCING GENDER-EQUAL BENEFITS  
IN CLEAN COOKING OPERATIONS**

© 2022 International Bank for Reconstruction and Development / The World Bank  
1818 H Street NW, Washington, DC 20433  
Telephone: 202-473-1000; internet: [www.worldbank.org](http://www.worldbank.org)

This work is a product of the staff of The World Bank with external contributions. The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of The World Bank, its Board of Executive Directors, or the governments they represent. The World Bank does not guarantee the accuracy of the data included in this work and accepts no responsibility for any consequences of their use. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgment on the part of The World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

Nothing herein shall constitute or be considered to be a limitation upon or waiver of the privileges and immunities of The World Bank, all of which are specifically reserved.

#### RIGHTS AND PERMISSIONS

The material in this work is subject to copyright. Because The World Bank encourages dissemination of its knowledge, this work may be reproduced, in whole or in part, for noncommercial purposes as long as full attribution to this work is given. All queries on rights and licenses, including subsidiary rights, should be addressed to World Bank Publications, The World Bank Group, 1818 H Street NW, Washington, DC 20433, USA; fax: +1-202-522-2625; e-mail: [pubrights@worldbank.org](mailto:pubrights@worldbank.org). Furthermore, the ESMAP Program Manager would appreciate receiving a copy of the publication that uses this publication for its source sent in care of the address above, or to [esmap@worldbank.org](mailto:esmap@worldbank.org).

This work is available under the Creative Commons Attribution 3.0 IGO license (CC BY 3.0 IGO) <http://creativecommons.org/licenses/by/3.0/igo>. Under the Creative Commons Attribution license, you are free to copy, distribute, transmit, and adapt this work, including for commercial purposes, under the following conditions:

*Attribution*—Please cite the work as follows: Energy Sector Management Assistance Program (ESMAP). 2022. *Opening Opportunities, Closing Gaps: Advancing Gender-Equal Benefits in Clean Cooking Operations*. Washington, DC: World Bank. License: Creative Commons Attribution CC BY 3.0 IGO

*Translations*—If you create a translation of this work, please add the following disclaimer along with the attribution: This translation was not created by The World Bank and should not be considered an official World Bank translation. The World Bank shall not be liable for any content or error in this translation.

*Adaptations*—If you create an adaptation of this work, please add the following disclaimer along with the attribution:  
This is an adaptation of an original work by The World Bank. Views and opinions expressed in the adaptation are the sole responsibility of the author or authors of the adaptation and are not endorsed by The World Bank.

All images remain the sole property of their source and may not be used for any purpose without written permission from the source.

*Cover photos (left to right)*: © Vincent Tremeau/Ci-Dev, World Bank; © Nick Wambugu/Clean Cooking Alliance; © Jon Leary/MECS. Used with the permission of Vincent Tremeau/Ci-Dev, World Bank; Nick Wambugu/Clean Cooking Alliance; and Jon Leary/MECS. Further permission required for reuse.

*Cover and interior design*: Debra Naylor, Naylor Design, Inc.

# Opening Opportunities, Closing Gaps

ADVANCING GENDER-EQUAL BENEFITS  
IN CLEAN COOKING OPERATIONS

# Contents

Acknowledgments v

Abbreviations vi

Glossary vii

## **Overview 1**

Notes 3

References 3

## **PART 1. WHY INTEGRATING GENDER MATTERS 5**

### **1. Gender-Differentiated Impacts of Traditional Technology Reliance 7**

Key Impact Areas 7

Harm Mitigation and Spillover Benefits 9

Notes 10

References 11

### **2. Promoting Women's Agency 13**

Key Gender Norms and Behavior 13

Addressing the Gendered Aspects of Interventions 14

References 15

## **PART 2. WHAT OPPORTUNITIES CAN EMPOWER WOMEN? 17**

### **3. Integrating Gender across the Value Chain 19**

Design and Testing 20

Manufacture and Assembly 21

Wholesaling and Distribution 22

Marketing and Retailing 25

Fuel Supply and Distribution 29

After-Sales Support 29

Notes 30

References 31

### **4. Financing 33**

Supplier-Side Models 33

Consumer-Side Models 34

Impact-Driven Models 37

Notes 37

References 37

<b>5. Enabling Policies and Market Support</b>	<b>39</b>
Policies, Regulations, and Standards Development	39
Research, Advocacy, and Market Intelligence	40
Awareness Raising to Stimulate Behavior Change and Uptake	42
Training, Capacity Strengthening, and Business Development	43
Note	45
References	45

## **PART 3. HOW TO DESIGN GENDER-RESPONSIVE PROJECTS**      **47**

<b>6. Practical Guidance for Task Teams</b>	<b>49</b>
---	-----------

Analysis	49
Stakeholder Consultations	51
Safeguard Screening	54
Project Design	55
Monitoring, Verification, and Evaluation	57
Budget Issues and Human Resources	59
Notes	60
References	60

<b>7. Closing the Gaps</b>	<b>63</b>
----------------------------	-----------

References	63
------------	----

### **Boxes**

O.1 The World Bank's commitment to closing gaps	3
1.1 Improving women's health induces higher productivity: Evidence from Indonesia's fuel-switching program	10
3.1 Stove company's competitive strategy puts women's feedback front and center	20
3.2 Improving stove-user acceptability in Cambodia and Indonesia	21
3.3 Adapting production methods and training to fit women's needs	22
3.4 Empowering female biogas masons: Lessons from a pilot project in Vietnam	23
3.5 Breaking gender norms is a "win-win" for a stove-company facility in Kenya	23
3.6 Social enterprise supports female micro-entrepreneurs by coordinating logistics	24
3.7 World Bank project experience with women's wholesaler groups	24
3.8 Community-based organization leverages women's network for product distribution	24
3.9 Private spinoff company supports rural women retailers through capacity building, wholesaler services, and logistics	25
3.10 Clean cooking TV and radio series reaches millions of viewers in Kenya	26
3.11 Demonstrated cash savings reduces perceived risk of product adoption	26
3.12 Men's role in promoting widespread stove adoption in Honduras	27
3.13 Overlooking literacy can adversely impact stove transitions	28
3.14 Focus group discussions reveal gendered perceptions of clean cooking solutions	28
3.15 Nepal improved charcoal project recruits women in training and business creation	29
3.16 Women-led, niche LPG businesses in Ghana advance with the right support	30
4.1 Financing's role in breaking barriers to women's empowerment	35
4.2 Women's savings groups in Kenya provide flexibility that formal institutions lack	35
4.3 Grameen Shakti tailors payment plans to technologies	36
5.1 RISE to benchmark progress in closing gender gaps in clean cooking	40
5.2 Ghana's Second Lady uses her platform to promote adoption of clean cooking solutions	41
5.3 Testing hypotheses about female entrepreneurs' effectiveness	41
5.4 Actionable business insights from working with female micro-entrepreneurs	42
5.5 Combining agency-based empowerment, business development services, and anchor-customer identification in Kenya	44

5.6	The value of training women in technical stove skills	45
6.1	Checklist for integrating analysis issues into clean cooking and heating projects	50
6.2	Analytical work by the IMF highlights key areas for narrowing gender gaps	50
6.3	Gender analysis is not limited to the project design phase	52
6.4	Multilayer consultations in Pakistan	53
6.5	Stakeholder consultations identifying women's needs spur a successful advocacy movement in Sudan	53
6.6	Setting and tracking targets for inclusive consultations: The first step in achieving balance	54
6.7	Corporate policies in Cambodian briquette business create an inclusive work environment for both women and men	55
6.8	MV&E: A design component of Clean Cooking Fund–financed projects	58
6.9	Using technical assistance funds to close gender gaps	60

### **Figures**

1.1	Gender comparisons of time spent on cooking-related tasks for selected African countries	8
3.1	Promoting women's empowerment across the value chains	19
6.1	Illustrative metrics spectrum for MV&E	57

### **Map**

O.1	The World Bank's global presence in clean cooking and heating	2
-----	---	---

# Acknowledgments

This report provides World Bank task teams and the gender and social development specialists that support them key arguments, empirical evidence, and practical guidance on entry points for integrating gender considerations into programs focused on clean cooking (and heating to a lesser extent). To our knowledge, this is the first attempt to synthesize the available knowledge on the subject, including best-practice case examples.

The report was prepared by a team of the World Bank's Energy Sector Management Assistance Program (ESMAP), led by Nathyeli Acuña Castillo (Gender Specialist) and Yabei Zhang (Senior Energy Specialist) and including Caroline Adongo Ochieng, Norma Adams, Inka Schomer, Jingyi Wu, Alisha Pinto, Jenny Greene, Ellen Morris, and Magi Matinga. The team appreciates overall guidance provided by ESMAP Practice Manager Gabriela Elizondo Azuela and the constructive feedback received from peer reviewers Dana Charron of the Berkeley Air Monitoring Group and Affouda Léon Biaou (Senior Energy Specialist) and Helle Buchhave (Senior Social Development Specialist) of the World Bank. Norma Adams edited and coordinated production of the report, which was designed and typeset by Debra Naylor of Naylor Design, Inc.

The team is especially grateful to the many practitioners in the Clean Cooking Community of Practice who submitted photographs to be considered for inclusion in the report. The team also extends thanks to Jingyi Wu and Norma Adams for managing the selection process.

Finally, the financial support of ESMAP is gratefully acknowledged. ESMAP is a partnership between the World Bank and development partners and private nonprofit organizations that helps low- and middle-income countries reduce poverty and boost growth through sustainable energy solutions. ESMAP's analytical and advisory services are fully integrated within the World Bank's country financing and policy dialogue in the energy sector. Through the World Bank Group (WBG), ESMAP works to accelerate the energy transition required to achieve Sustainable Development Goal 7 (SDG 7) to ensure access to affordable, reliable, sustainable, and modern energy for all. It helps to shape WBG strategies and programs to achieve International Development Association (IDA) policy commitments and the WBG Climate Change Action Plan targets.

# Abbreviations

ADALY	averted disability-adjusted life year
CCA	Clean Cooking Alliance
CCF	Clean Cooking Fund
CSI	Clean Stove Initiative
DALY	disability-adjusted life year
ECCH	Efficient, Clean Cooking and Heating (program)
ESS	Environmental and Social Standards
FGD	focus group discussion
FPIC	Free, Prior, and Informed Consent
GAP	gender action plan
HAP	household air pollution
ICR	implementation completion report
ICS	improved cookstoves
ISO	International Organization for Standardization
LMIC	low- and middle-income countries
LPG	liquefied petroleum gas
MECS	Modern Energy Cooking Services
MFI	microfinance institution
MTF	Multi-Tier Framework
MV&E	monitoring, verification, and evaluation
PAD	project appraisal document
PAYG	pay-as-you-go
PCN	project concept note
PM	particulate matter
RBF	results-based financing
SDG	Sustainable Development Goal
SEforALL	Sustainable Energy for All
SLCP	short-lived climate pollutant
SMEs	small- and medium-sized enterprises
VAWG	violence against women and girls

# Glossary

**Agency**—The capacity to make decisions about one's own life and act on them to achieve a desired outcome, free of violence, retribution, or fear.<sup>a</sup>

**Clean Cooking Fund (CCF)**—World Bank–hosted US\$500 million fund launched by the Efficient, Clean Cooking and Heating (ECCH) Program at the UN 2019 Climate Summit to scale up investments in the clean cooking sector.

**Clean cooking solutions**—Fuel-and-stove combinations that achieve emissions performance measurements of Tier 4 or higher following ISO/TR 19867-3:2018 Voluntary Performance Targets (VPTs).<sup>b</sup>

**Efficient, Clean Cooking and Heating (ECCH)**—World Bank–supported program (2015–20) to advance the clean cooking agenda through technical advice and country/regional grants to the World Bank's operational teams.

**Empowerment**—Mechanism by which people, organizations, and communities gain mastery over their lives.

**Gender-based violence (GBV)**—Umbrella term for any harmful act perpetrated against a person's will that is based on socially ascribed (i.e., gender) differences between males and females. GBV includes acts that inflict physical, mental, or sexual harm or suffering; threats of such acts; and coercion and other deprivations of liberty, whether occurring in public or private life.<sup>c</sup>

**Gender equality**—Refers to how gender factors (i.e., the social, behavioral, and cultural attributes, expectations, and norms associated with being male or female) determine the ways in which women and men relate to each other and the resulting differences in power between them.<sup>d</sup>

**Gender norms**—Commonly accepted social or cultural rules that specify male and female characteristics, roles, acceptable behaviors, and capacities.

**Gender roles**—A set of social norms that are considered appropriate for a specific gender group.

**Modern Energy Cooking Services (MECS)**—Refers to a household context that has met the standards of Tier 4 or higher across all six measurement attributes of the Multi-Tier Framework for cooking: (i) convenience, (ii) (fuel) availability (a proxy for reliability), (iii) safety, (iv) affordability, (v) efficiency, and (vi) exposure (a proxy for health related to exposure to pollutants from cooking activities).<sup>e</sup>

**Multi-Tier Framework (MTF) for cooking**—Multidimensional, tiered approach to measuring household access to cooking solutions across six technical and contextual attributes with detailed indicators and six thresholds of access, ranging from Tier 0 (no access) to Tier 5 (full access). The aggregate MTF tier is the lowest tier rating across the six attributes.

**Social norms**—Collectively agreed-on standards and rules that most members of a group or society adhere to and accept.

---

Note: The above definitions are generally consistent with those found in other World Bank publications or are otherwise consistent with the standard terminology applied in the clean cooking and gender field.

a. Jeni Klugman, Lucia Hanmer, Sarah Twigg, Tazeen Hasan, Jennifer McCleary-Sills, and Julieth Santamaría; *Voice and Agency: Empowering Women and Girls for Shared Prosperity* (Washington, DC: World Bank, 2014).

b. World Health Organization (WHO), *Guidelines for Indoor Air Quality: Household Fuel Combustion* (Geneva: World Health Organization, 2014).

c. Inter-Agency Standing Committee (IASC), "Gender-Smart Investing: Off-Grid Energy Case Study, Bidhaa Sasa." [https://www.icrw.org/wp-content/uploads/2018/12/ICRW\\_Bidhaa-Sasa\\_CaseStudy.pdf](https://www.icrw.org/wp-content/uploads/2018/12/ICRW_Bidhaa-Sasa_CaseStudy.pdf).

d. World Bank, *World Development Report 2012: Gender Equality and Development* (Washington, DC: World Bank, 2012).

e. Energy Sector Management Assistance Program (ESMAP), *The State of Access to Modern Energy Cooking Services* (Washington, DC: World Bank Group, 2020).



Hema Devi lives in India's mountainous district of Nainital in Uttarakhand state, where maintaining robust supply chains is difficult. Hema's biodigester provides a truly clean cooking fuel, substantially reducing her expenditure on LPG. © Karthick Prabakar/Inclusive Energy, Ltd. Used with the permission of Karthick Prabakar/Inclusive Energy, Ltd. Further permission required for reuse.

# Overview

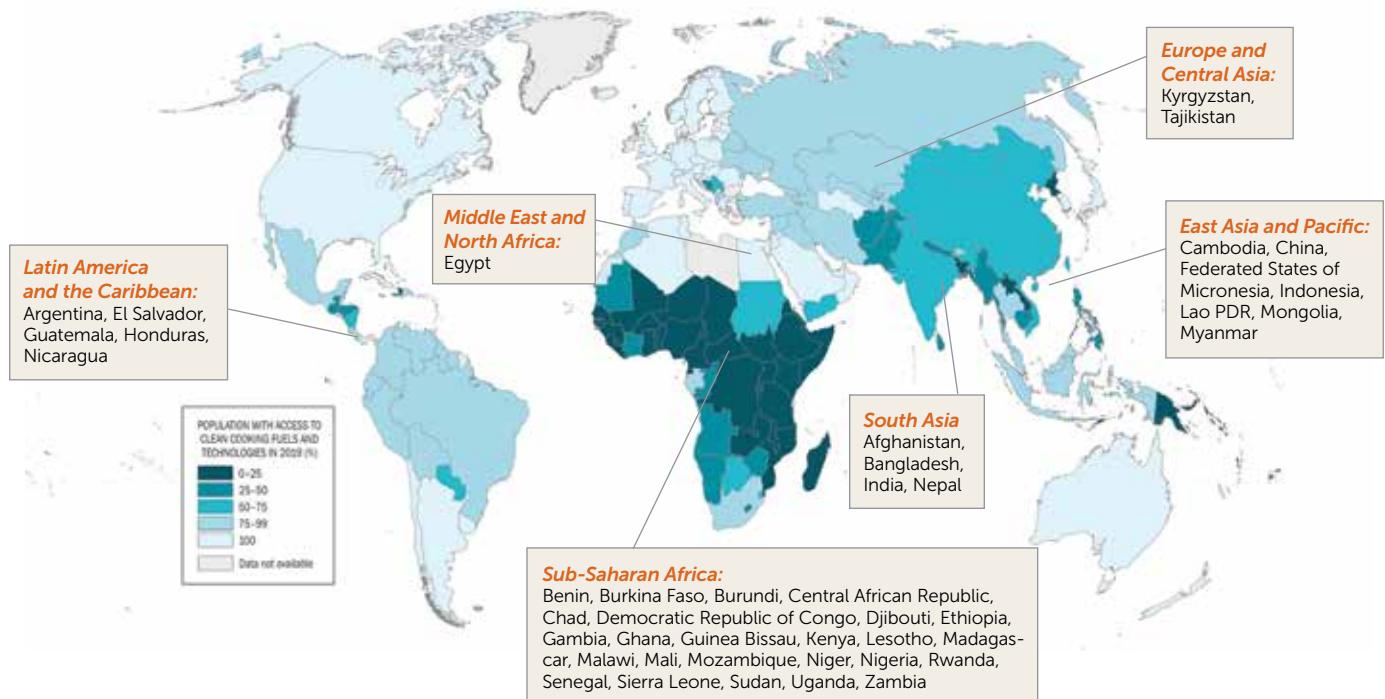
At the current rate of ambition, the world will fall short of achieving Sustainable Development Goal 7 (SDG 7) by 2030. Progress toward the target for access to clean cooking solutions (7.1.2) has been particularly slow, compared to those for electricity access (7.1.1), renewable energy (SDG 7.2), and energy efficiency (SDG 7.3). According to the latest tracking report by the custodian agencies for SDG 7 (IEA et al. 2021), 2.6 billion people were without access to clean cooking fuels in 2019; between 2010 and 2019, annual growth in access kept pace only marginally with population growth. Furthermore, about half of the global population—some 4 billion people—lack access to Modern Energy Cooking Services (MECS) (ESMAP 2020a). In Sub-Saharan Africa, MECS access stands at just 10 percent and only 36 percent and 57 percent in East Asia and Latin America and the Caribbean, respectively.

Slow progress toward access to clean cooking solutions has significant negative impacts on women (e.g., harm to health from disproportionate exposure to household air pollution [HAP]; safety hazards and risks to well-being; and the opportunity costs of fuelwood collection, fuel preparation, and inefficient cooking). The gender cost of inaction, in the form of women's lost productivity associated with time use, is estimated at US\$0.8 trillion per year (ESMAP 2020a).<sup>1</sup> Because the SDGs are cross-cutting, slow progress on access to clean cooking solutions for all also hinders progress toward meeting the targets under related SDGs, particularly SDG 3 (ensuring healthy lives and promoting universal well-being at all ages)<sup>2</sup> and SDG 5 (achieving gender equality and empowering all women and girls).<sup>3</sup>

To accelerate the transition to clean cooking by 2030, the World Bank's Energy Sector Management Assistance Program (ESMAP) has established the US\$500 million Clean Cooking Fund (CCF). Building on the achievements of the World Bank's Efficient, Clean Cooking and Heating (ECCH) Program (2015–20) (map O.1), the CCF was operationalized in 2020 to scale up commitments and public- and private-sector investments in the clean cooking sector. Under its country/regional investment program, the CCF catalyzes technology and business innovations and links incentives with verified results, using results-based financing (RBF) approaches to co-finance International Development Association (IDA) operations. Under its global platform for knowledge, innovation, and policy coordination, the CCF supports the development of methodologies to measure and monetize the gender co-benefits of clean cooking programs to support impact investments (ESMAP 2020b), as well as global policy initiatives (e.g., the High-Level Coalition of Leaders for Clean Cooking and the Health and Energy Platform of Action), including organizations that work directly to address gender gaps in energy access.

The success of such initiatives and future programs can be enhanced by gaining a greater appreciation of the gender gaps in clean cooking and heating operations and knowledge about how to bridge them. A portfolio review of 46 World Bank-financed projects (1989–2017) that included at least one clean cooking component or subcomponent revealed that gender considerations were not always integrated into project design or captured during evaluation (Tuntivate 2017), even though this had been required for projects predating this

**MAP O.1** The World Bank's global presence in clean cooking and heating, 2019<sup>a</sup>



Note: This map was produced by the Geospatial Operations Support Team (GOST) of the World Bank, and population data on access to clean cooking fuels and technologies was provided by the World Health Organization (WHO 2021).

a. Under its ECCH Program, the World Bank's active lending portfolio in clean cooking and heating increased to US\$400 million across 21 countries. In addition to 13 country-specific projects, ESMAP has supported two regional cooking and heating programs in Africa and Central America. A global database of cookstove initiatives and players is available at [energydata.info](https://energydata.info) (ESMAP 2020c).

period. If opportunities to close gender gaps are not articulated at a project's outset, they will likely be missed owing to the sector's unique characteristics. The World Bank Group is committed to addressing gender equality through its Gender Strategy (FY 2016–23) and project-level Gender Tag (box O.1). However, guidance is needed to ensure that operations in cooking and heating energy are fully aligned with these goals and the pathways through which they can be achieved.

This report introduces World Bank task teams and other practitioners to the key arguments, opportunities, and practical steps for integrating gender considerations into clean cooking programs. Part 1 presents the supporting arguments that

recognize women as both beneficiaries and agents of change. Part 2 stimulates task teams to think more broadly about the possible opportunities for advancing gender equality across the value chain, drawing on the rich experience of the World Bank's active lending portfolio, as well as best-case practices from private-sector initiatives and the literature on clean cooking and gender. Based on lessons from these empirical findings, Part 3 suggests practical steps for tailoring projects to the distinct needs of women and men and thus increasing the likelihood of (i) reducing gaps in asset ownership and human endowments and (ii) capitalizing on growth opportunities.<sup>4</sup>

## BOX O.1

### The World Bank's commitment to closing gaps

The World Bank Group's Gender Strategy (FY 2016–23) supports the commitment of the UN Sustainable Development Goals (SDGs) to achieving gender equality and the empowerment of women and girls (SDG 5). It clarifies the World Bank's pathways to empowering women as passing through (i) human endowments, (ii) more and better jobs, (iii) women's ownership and control of assets, and (iv) women's voice(s) and agency.

At the project level, the Gender Tag ensures that, from the project design stage, the World Bank's staff can optimize opportunities to narrow the gender gap between males and females in all four of the above-mentioned

areas and identify actions critical to achieving this. The Gender Tag also helps to capture lessons based on the World Bank's work in addressing gender inequalities.

Specifically, the Gender Tag requests that project teams (i) identify gaps between women and men and/or girls and boys, especially in light of the gaps identified in the Systematic Country Diagnostic and the Country Partnership Framework; (ii) identify specific actions to address these identified gender gaps and/or improve women's or men's empowerment; and (iii) include indicators in the results framework to monitor outcomes from the specific actions identified to address them.

## Notes

1. This figure does not include deaths or disability-adjusted life years (DALYs) linked to HAP. Even though the cost of women's time is conservatively estimated (US\$0.54 per hour), the value of their time spent on cooking-related tasks and drudgery is quite high (ESMAP 2020a).
2. Reducing smoke emissions from cooking decreases the burden of disease associated with HAP and improves well-being, especially for women and children.
3. Unpaid work, including collecting fuel and cooking, remains a major cause of gender inequality. Target 5.4 specifically aims to recognize and value unpaid care and domestic work through the provision of public services and infrastructure.
4. The report is to be accompanied by a toolkit to facilitate quick information access by practitioners.

## References

- ESMAP (Energy Sector Management Assistance Program). 2020a. *The State of Access to Modern Energy Cooking Services*. Washington, DC: World Bank Group.
- ESMAP (Energy Sector Management Assistance Program). 2020b. *Quantifying and Measuring Climate, Health, and Gender Co-Benefits from Clean Cooking Interventions: Methodologies Review*. Washington, DC: World Bank.
- ESMAP (Energy Sector Management Assistance Program). 2020c. *Access to Modern Energy Cooking Services: Players and Initiatives Database*. World Bank, Washington, DC.
- IEA, IRENA, UNSD, WBG, WHO (International Energy Agency, International Renewable Energy Agency, United Nations Statistics Division, World Bank Group, World Health Organization). 2021. *Tracking SDG 7: The Energy Progress Report*. Washington, DC: World Bank Group.
- Tuntivate, Voravate. 2017. "Review of Gender-Specific Impacts and Opportunities on Efficient, Clean Cooking and Heating Projects Financed by the World Bank." Unpublished draft, April 27.
- WHO (World Health Organization). 2021. "Global Health Observatory." World Health Organization, Geneva. <https://www.who.int/data/gho/data/themes/air-pollution/household-air-pollution>.



Cooking a meal indoors in rural India. © Curt Carnemark/World Bank. Further permission required for reuse.

PART  
**1**

## Why Integrating Gender Matters

1. Gender-Differentiated Impacts of Traditional Technology Reliance
2. Promoting Women's Agency



In the Bono East region of Ghana, a woman stands by a biomass stove with a large metal surface pan to process cassava grits (*gari*). Women spend 6–8 hours a day processing this staple food, putting the health of themselves and their children at risk.

© Omolola Oyinkan Adeshina. Used with the permission of Omolola Oyinkan Adeshina. Further permission required for reuse.

# 1 Gender-Differentiated Impacts of Traditional Technology Reliance

The rights-based argument for taking a gendered approach to clean cooking programs has been the cornerstone of cook-stove interventions for several decades. It recognizes how the experience of being male or female influences individuals' relationships to cooking technologies and their potential negative impacts on end users. Because social norms in many developing countries assign women the primary responsibility for household cooking and fuelwood collection, the impacts of relying on traditional stove-and-fuel combinations are unevenly distributed by gender. Likewise, the perceived benefits of clean cooking interventions are also gender-differentiated.

## Key Impact Areas

### Time Poverty

A global study by McKinsey & Company (2015) reports that 75 percent of the world's total unpaid work (e.g., cooking, firewood collection, and fetching water) is done by women. The unpaid work associated with domestic cooking falls into three main categories of time spent on (i) gathering and preparing fuel, (ii) food preparation and cooking, and (iii) cleaning utensils and the cooking and eating areas. World Bank data from more than 70 time-use surveys across various geographies shows that fuel collection is a significant time-opportunity cost for rural households, consuming an average of 1.3 hours per day (ranging from 30 minutes to more than 6 hours) (ESMAP 2015a).<sup>1</sup> According to assessments by the United Nations High Commissioner for Refugees (UNHCR) for Central and East Africa, women in refugee communities walk an average of more than 5 hours per trip to collect firewood for cooking and heating (IHEON 2016). Based on data from the World Bank

analysis of seven African countries, women assume a disproportionate share of responsibility for cooking, at an average of 2.7 hours per day compared to 0.35 hours per day for men (figure 1.1). Equalizing the time and effort spent on such unpaid work could help equalize wage labor participation rates, theoretically shrinking income gaps between women and men.

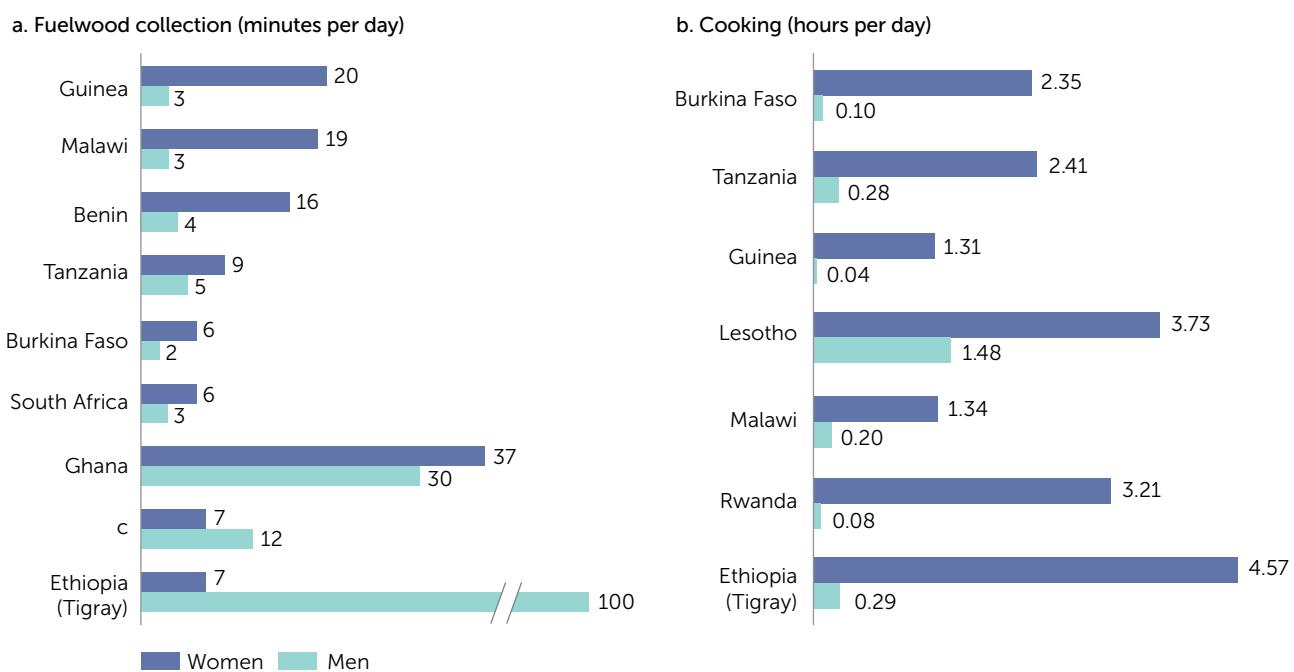
### Drudgery

Work performed that is perceived as repetitive, physically laborious, and difficult, as well as time consuming, is referred to as drudgery. In many developing countries, women bear a disproportionate share of any drudgery burden related to household cooking. Although closely linked to time poverty, drudgery should be separately assessed since some time-consuming, cooking-related tasks may not be perceived as unenjoyable (e.g., socializing during communal cooking).<sup>2</sup> Drudgery can result from traveling long distances or navigating difficult terrain to collect fuels (e.g., firewood or coal). It may also encompass fuel processing (e.g., making dung cakes or chopping wood), actual stove use (e.g., lighting, flame control, and fire management), and post-cooking clean-up chores (e.g., scrubbing sooty pots and utensils, stoves, fireplaces, walls, and ceilings; washing clothes).

### Health Burden of Household Air Pollution

The health impacts from household air pollution (HAP) associated with smoke emissions from traditional cookstoves are well established. According to 2012 burden-of-disease estimates, exposure to HAP accounted for some 4.3 million premature deaths each year (WHO 2016), with women and children accounting for more than 60 percent (WHO 2021). Millions more suffer from serious illnesses caused by air pollution from

**FIGURE 1.1** Gender comparisons of time spent on cooking-related tasks for selected African countries



Source: ESMAP 2015b.

Note: Countries where the fuel-collection responsibility is assumed mainly by men (Ethiopia) or more equally shared by men and women (Ghana) reflect contextual differences in cultural norms and practices that even vary within country. Such findings underscore the importance of understanding the local context when designing projects.

cooking and heating with traditional stoves and fuels. In low- and middle-income countries (LMIC), the rates of chronic obstructive pulmonary disease (COPD) among non-smoking women are quite high. In fact, women exposed to high levels of indoor smoke are more than twice as likely to suffer from COPD as their counterparts who use cleaner stove technologies and fuels (WHO 2018). In LMIC, HAP is the single leading environmental health risk and a main cause of stroke, lung cancer, and heart disease among women. In Kenya, for example, women's exposure to particulate matter (PM) emissions from cooking-related activities is estimated at four times that of men, while in South Asia women experience double the exposure levels of men (WHO 2016).

### Safety Hazards and Risks to Well-Being

The gender-differentiated risks associated with household use of traditional cooking and heating practices fall into the following categories:

- **Violence or exploitation in the course of acquiring fuels.** Various humanitarian agencies have reported risks to personal safety during firewood collection. For example, in Darfur, Sudan, 500 rapes over a five-year period reportedly occurred outside villages and camps when women had to undertake indispensable activities, including firewood and

water collection (MSF 2005). A study of refugee camps in Uganda and Chad showed that, over a six-month period, 41 percent and 42 percent of households, respectively, reported incidences of violence during firewood collection (UNHCR 2014).<sup>3</sup>

- **Physiological injury from transporting large fuel quantities.** Heavy firewood loads, often weighing more than 20 kg per load, can contribute to chronic musculoskeletal injuries and possibly poor maternal health outcomes, including miscarriages and obstructed labor (Echarri and Forriol 2002, 2005; Ravindran, Savitri, and Bhovani 2000; WHO 2016) (photo 1.1).
- **Physical accidents from safety hazards.** These include burns, fires, blunt trauma, and explosions from cooking and heating appliances. In Malawi, a study assessing the health impacts of traditional fires observed several incidences of burns among women and children (Mortimer et al. 2017). The study found that households that used an advanced biomass stove experienced a 40 percent reduction in burn incidences. In India, it was reported that women represented 82 percent of victims from LPG cooking-stove explosions (Philip 2013). And in Kenya, it was found that women were the most likely victims of kerosene stove explosions (Ombati, Ndaguatha, and Wanjeri 2013).

**PHOTO 1.1** Collecting fuelwood in rural Rwanda



© David Bittrner/Ci-Dev, World Bank. Further permission required for reuse.

- **Intimate partner violence.** Women are often the cooks and a bad meal can have serious consequences. Not having food ready on time is among the widely reported triggers of intimate partner violence (Heise, Ellsberg, and Gottmoeller 2002). In a survey across 41 developing countries, 21 percent of the women interviewed believed it was acceptable or justifiable for a woman to be beaten if they burned food (World Bank 2012). Disagreements over cooking and heating expenditures can pose added risks.

#### Household Expenditure

For households reliant on traditional cooking solutions, energy expenditure can have a large economic impact, particularly in poor urban areas, where families may spend up to 15–20 percent of their monthly income on cooking fuels (e.g., charcoal) (ESMAP 2019). High fuel costs result from inefficient stove-and-fuel combinations, along with the inability to purchase fuels in bulk in order to benefit from economies of scale. In many settings, gender norms assign women the role of acquiring

ing cooking fuels, including their purchase, often within tight budgetary constraints. Women have been reported to make significant trade-offs to acquire cooking fuels and stoves, including foregoing purchases of food and clothes; they commonly report financial savings as a benefit of adopting more efficient cooking systems (ESMAP 2021).

#### Harm Mitigation and Spillover Benefits

The potential of clean stove interventions to mitigate the harm derived from the use of polluting stove-and-fuel combinations is influenced by a variety of factors, including the stove technology, fuel availability, level of traditional stove displacement, and household cooking practices, among others. Cook-stove programs also vary in the prioritization of their impact objectives (e.g., gender equality, better health, or cleaner climate) and performance against them. For example, a biogas stove intervention may achieve maximum health benefits but

increase women's fuel preparation time. Such evidence has been synthesized in systematic reviews, including a recent one conducted by the World Bank (ESMAP 2021). While individual study results have been mixed, the overall evidence shows positive impacts on prioritized gender outcomes (e.g., women's time use and self-reported well-being) but less impact on objectively measured health outcomes (e.g., chronic respiratory conditions). One exception is Indonesia's large-scale, clean-fuel transition program (box 1.1).

Mitigating the harmful effects of polluting cookstoves has no one-size-fits-all solution. What works in one setting may not be transferable to others. The impact of cooking solutions will vary based on market circumstances and the social impact deemed most important. Even when the relative benefits of solutions are clear, extrapolating from the features of an individual stove to the potential market-level impact is difficult due to such factors as stove and fuel affordability and

### BOX 1.1

#### **Improving women's health induces higher productivity: Evidence from Indonesia's fuel-switching program**

A recent evaluation of Indonesia's government-led Kerosene-to-LPG Conversion Program, based on a longitudinal survey spanning more than 14 years (2000, 2007, and 2014), reports positive outcomes for women's health and labor supply. The improvement in women's lung capacity over a three-year period was about 4 percent,<sup>a</sup> which was correlated with a 20 percent increase in their work hours. According to the evaluation, an even larger impact can be expected among women in households that transition from traditional biomass to LPG.

Sources: Thoday et al. 2018; Verma and Imelda 2021.

a. The evaluation found no statistically significant improvement in men's lung capacity, which is consistent with the hypothesis that women, who spend most of their time indoors engaged in household chores and cooking, should accrue the greatest health benefit.

consumers' willingness to adopt a specific technology, among others (ESMAP 2015b). Thus, any cookstove intervention program should incorporate its own evaluation at the design stage to confirm its benefits for women and men (Part 3).

Beyond the hypothesized outcomes of clean cooking interventions, studies have reported unintended spillover effects, both positive and negative. The Indonesia Kerosene-to-LPG Conversion Program, for example, found a 13 percent increase in men's labor supply following the switch to clean cooking. The program evaluation attributes this increase to a positive spillover effect from improvement in women's health and its effect on intra-household division of labor. Although research is scant, some evidence suggests that, when households use clean cooking technologies and/or fuels, men are more likely to cook. In South Africa, this was observed in rural areas (Matinga 2010), as well as urban areas (Annecke 2005), after households switched to electric cooking. The removal of arduous fire-management requirements and the elimination of smoke emissions were key factors in men's engagement (Matinga 2010). Similarly, in Uganda (Kabarole Resource and Research Centre 2013) and Nepal (Meeks 2021), cases were noted of men's engagement in cooking after households accessed biogas. At the 2019 Clean Cooking Forum in Nairobi, the Kenya Power and Lighting Company reported men to have shown enthusiasm and interest in cooking during electric cooking demonstrations. As men have rarely been the target group of cookstove promotion efforts and programs (Ochieng et al. 2021), these unintended positive benefits are of considerable interest and warrant more systematic evaluations.

### Notes

1. One should note that the data referred to was not disaggregated by gender group. However, given that men and boys collect fuels in some parts of the developing world, it is hoped that future studies can provide such granular data.
2. This is an area that warrants further investigation across settings.
3. It must be acknowledged that sexual violence is a complex issue that technological solutions alone are unlikely to solve. The World Bank, with its partners, has developed a resource guide for staff and member countries that provides basic information on the characteristics and consequences of violence against women and girls (VAWG); how to integrate VAWG prevention and provide quality services for survivors; and how to integrate VAWG strategies into policies, legislation, programs, and projects. The World Bank has created a task force to strengthen the institutional risk response to gender-based violence (GBV) (World Bank 2017a) and an action plan to prevent and respond to all types of GBV across its operations (World Bank 2017b).

## References

- Annecke, W. 2005. "Whose Turn Is It to Cook Tonight? Changing Gender Relations in a South African Township." Cape Town, South Africa: Collaborative Research Group on Gender and Energy and United Kingdom Department for International Development. <http://citeserex.ist.psu.edu/viewdoc/download?doi=10.1.1.1012.9717&rep=rep1&type=pdf>.
- Echarri, J., and F. Forriol. 2002. "Effect of Axial Load on the Cervical Spine: A Study of Congolese Woodbearers." *International Orthopaedics (SICOT)* 26: 141–41. <https://doi.org/10.1007/s00264-002-0336-6>.
- Echarri, J., and F. Forriol. 2005. "Influence of the Type of Load on the Cervical Spine: A Study on Congolese Bearers." *U.S. National Library of Medicine* 5 (3): 291–96. <https://doi.org/10.1016/j.spinee.2004.09.010>.
- ESMAP (Energy Sector Management Assistance Program). 2015a. *Beyond Connections: Energy Access Redefined*. Technical Report 008/15. Washington, DC: World Bank.
- ESMAP (Energy Sector Management Assistance Program). 2015b. *The State of the Global Clean and Improved Cooking Sector*. Technical Report 007/15. Washington, DC: World Bank.
- ESMAP (Energy Sector Management Assistance Program). 2019. *Beyond Connections: Kenya Energy Access Diagnostic Report Based on the Multi-Tier Framework*. Washington, DC: World Bank Group.
- ESMAP (Energy Sector Management Assistance Program). 2021. *What Drives the Transition to Modern Energy Cooking Services?: A Systematic Review of the Evidence*. ESMAP Technical Report 015/21. Washington, DC: World Bank Group. <http://documents.worldbank.org/curated/en/518251613714281312/What-Drives-the-Transition-to-Modern-Energy-Cooking-Services-A-Systematic-Review-of-the-Evidence>.
- HEDON. 2016. "Energy in Emergency Settings." *Boiling Point*, Issue 68. Chislehurst, UK: HEDON Household Energy Network.
- Heise, L., M. Ellsberg, and M. Gottmoeller. 2002. "A Global Overview of Gender-based Violence." *International Journal of Gynecology & Obstetrics* 78: S5–14.
- Kabarole Research and Resource Centre. 2013. "A Case Study: Gender and Workload in Biogas Adoption, Uganda." Fort Portal, Uganda: Kabarole Research and Resource Centre. [https://www.academia.edu/13070251/A\\_CASE\\_STUDY\\_GENDER\\_AND\\_WORKLOAD\\_IN\\_BIOGAS\\_ADOPTION\\_UGANDA?auto=download](https://www.academia.edu/13070251/A_CASE_STUDY_GENDER_AND_WORKLOAD_IN_BIOGAS_ADOPTION_UGANDA?auto=download).
- Matinga, M. N. 2010. "We Grow Up with It: An Ethnographic Study of the Experiences, Perceptions and Responses to the Health Impacts of Energy Acquisition and Use in Rural South Africa." PhD diss., University of Twente, Enschede, the Netherlands. <https://core.ac.uk/download/pdf/11478758.pdf>.
- McKinsey & Company. 2015. *The Power of Parity: How Advancing Women's Equality Can Add \$12 Trillion in Global Growth*. <https://www.mckinsey.com/featured-insights/employment-and-growth/how-advancing-womens-equality-can-add-12-trillion-to-global-growth>.
- Meeks, R. 2021. "Exploring Renewable Biogas Energy in Nepal." News. Ann Arbor: School for Environment and Sustainability, University of Michigan. <https://seas.umich.edu/news/exploring-renewable-bio-gas-energy-nepal>.
- Mortimer, Kevin, Chifundo Ndamala, Andrew Naunje, Jullita Malava, Cynthia Katundu, and William Weston, et al. 2017. "A Cleaner Burning Biomass-Fuelled Cookstove Intervention to Prevent Pneumonia in Children under 5 Years Old in Rural Malawi (the Cooking and Pneumonia Study): A Cluster Randomised Controlled Trial." *The Lancet* 389 (10065): 167–75. [https://doi.org/10.1016/S0140-6736\(16\)32507-7](https://doi.org/10.1016/S0140-6736(16)32507-7).
- MSF (Médecins sans Frontières). 2005. *The Crushing Burden of Rape: Sexual Violence in Darfur*. Amsterdam: Médecins sans Frontières. <https://www.msf.org/rape-and-sexual-violence-ongoing-darfur-sudan>.
- Ochieng, C. A., U. Murray, J. Owuor, and C. Spillane. 2021. "The Forgotten Half: Men's Influence over Cookstove Adoption Decisions in Northern Kenya." *Energy Research & Social Science* 74 (April): 101913. <https://doi.org/10.1016/j.erss.2021.101913>.
- Ombati, Alex N., Peter L. W. Ndaguatha, and Joseph K. Wanjeri. 2013. "Risk Factors for Kerosene Stove Explosion Burns Seen at Kenyatta National Hospital in Kenya." *Burns* 39 (3): 501–6. <https://doi.org/10.1016/j.burns.2012.07.008>.
- Philip, Christin Matthew. 2013. "LPG Cylinder Is a Ticking Bomb in State." *The Times of India*, July 15. <https://timesofindia.indiatimes.com/city/chennai/LPG-cylinder-is-a-ticking-bomb-in-state/article-show/14683460.cms>.
- Ravindran, T. K. S., R. Savitri, and A. Bhowani. 2000. "Women's Experiences of Utero-vaginal Prolapse: A Qualitative Study from Tamil Nadu, India." In *Safe Motherhood Initiatives: Critical Issues*, edited by M. Berer and T. K. S. Ravindran, 166–72. Oxford: Blackwell Science.
- Thoday, K., P. Benjamin, M. Gan, and Elisa Puzzolo. 2018. "The Mega Conversion Program from Kerosene to LPG in Indonesia: Lessons Learned and Recommendations for Future Clean Cooking Energy Expansion." *Energy for Sustainable Development* 46 (October): 71–81. <https://doi.org/10.1016/j.esd.2018.05.011>.
- UNHCR (United Nations High Commissioner for Refugees). 2014. "Statistical Snapshot: Access to Improved Cookstoves and Fuels and Its Impact on Women's Safety in Crises." Statistical Snapshot. Washington, DC: Global Alliance for Clean Cookstoves. <https://cleancookstoves.org/binary-data/ATTACHMENT/file/000/000/331-1.pdf>.
- Verma, Anjali P., and I. Imelda. 2021. "Clean Energy Access: Gender Disparity, Health, and Labor Supply." *EconPapers*, January 9. <https://EconPapers.repec.org/RePEc:cte:werepe:29397>.
- WHO (World Health Organization). 2016. *Burning Opportunity: Clean Household Energy for Health, Sustainable Development, and Wellbeing of Women and Children*. Geneva: World Health Organization. [http://apps.who.int/iris/bitstream/handle/10665/204717/9789241565233\\_eng.pdf;jsessionid=330D08AEF97139ABDF4CE297AEB0C72A?sequence=1](http://apps.who.int/iris/bitstream/handle/10665/204717/9789241565233_eng.pdf;jsessionid=330D08AEF97139ABDF4CE297AEB0C72A?sequence=1).
- WHO (World Health Organization). 2018. "Household Air Pollution and Health: Key Facts." Geneva: World Health Organization. <https://www.who.int/news-room/fact-sheets/detail/household-air-pollution-and-health#:~:text=One%20in%20four%20or%2025,use%20cleaner%20fuels%20and%20technologies>.
- WHO (World Health Organization). 2021. "Household Air Pollution Is a Gender Issue." Geneva: World Health Organization. <https://www.who.int/life-course/news/household-air-pollution/en/>.
- World Bank. 2012. *World Development Report 2012: Gender Equality and Development*. Washington, DC: World Bank.
- World Bank. 2017a. *Working Together to Prevent Sexual Exploitation and Abuse*. Report of the Global Gender-Based Violence Task Force. <http://documents.worldbank.org/curated/en/482251502095751999/pdf/117972-WP-PUBLIC-recommendations.pdf>.
- World Bank. 2017b. "Global Gender-Based Violence Task Force: Action Plan for Implementation." <http://documents.worldbank.org/curated/en/206731510166266845/pdf/121031-WP-PUBLIC-Gender-Based-Violence-Task-Force-Action-Plan.pdf>.



Understanding women's unique cooking practices and preferences can shed light on which technical solutions may increase household uptake of clean cooking solutions over the long term. © Clean Cooking Alliance. Used with permission of the Clean Cooking Alliance. Further permission required for reuse.

# 2

## Promoting Women's Agency

A key argument for integrating gender considerations into clean cooking interventions is enhancing women's agency (e.g., by providing opportunities for their employment and access to capital). Increasingly, the clean cooking sector perceives women as vital participants in market expansion. By understanding and harnessing the influence of context-specific gender and social norms to empower women as both consumers and suppliers of clean cooking solutions, intervention strategies are more likely to succeed.

### Key Gender Norms and Behavior

#### Product Preferences and Uptake

Because cooking practices are usually passed down across generations, introducing clean cooking technologies could disrupt some of the most intimate and emotive of human traditions. Also, women's and men's preferences for clean cooking and heating products, as well as other household energy services, may differ; in turn, those products and services may have gender-differentiated impacts. Many of the early programs promoting clean cooking solutions failed because they did not consult the primary stove users, who were usually women (Kammen 1995). Understanding gender norms and male-female relationships at the household, community, and national level can shed light on which technical solutions, business models, and program and policy frameworks are the best fit (photo 2.1).

#### Energy Efficiency Management

As consumers, women may be more sustainability oriented than men. The European Institute for Gender Equality, for example, reported that women are more likely to value energy-efficient fuels and change their behavior to achieve energy-efficiency goals (EIGE 2012). In Bandung, Indonesia, a study of household electricity and LPG use showed that energy consumption was lowest in households where women were the sole decision-makers for energy expenditure, suggesting that they may be more efficient energy managers (Permana, Aziz, and Siong 2015).

#### Decision-Making Power

Women may not always have decision-making autonomy about whether to adopt clean cooking technologies. In Bangladesh, Miller and Mobarak (2011) found that women had a stronger preference for health-improving cookstoves than did men, but lacked the decision-making power to purchase them. A World Bank study in Indonesia revealed a similar pattern; while women did most of the cooking, men made the purchasing decisions and were less willing to pay for the improved cookstoves (World Bank 2015).

#### Effect of Non-Energy Gender Norms

How women and men access and benefit from clean cooking and heating technologies is also affected by gender norms outside the energy sector. For example, women's limited mobility and access to information may constrain their knowledge and adoption of modern fuels (Cecelski and Matinga 2014).

**PHOTO 2.1** Demonstrating the convenience of LPG for nighttime cooking in the Democratic Republic of Congo



© Bboxx Capital RDC. Used with the permission of Bboxx Capital RDC. Further permission required for reuse.

### Addressing the Gendered Aspects of Interventions

For all of the above-mentioned reasons, the gendered aspects of clean cooking and heating interventions should be considered across the project cycle, as follows:

- Understand the degree to which projects are equitable in their distribution of impacts. This can include the apportionment of jobs; income and asset building among project participants; or the opportunity to access skills training, capacity building, or other means of increasing human endowments. To illustrate, a project in West Africa promoting improved fish-smokers had to deal with resentment and backlash from men in the community who supplied women the fish for smoking; the men believed the project accorded the bulk of its benefits to women while ignoring their plight (Goetz 1989). To gain a deeper understanding of the differential impacts of clean cooking projects on

men and women and male-female relationships, targeted research would be necessary. Better communication with stakeholder groups can also help to manage expectations, build community consensus, and mitigate backlash such as that exemplified by the West Africa project.

- Reduce pre-existing gender gaps. The expansion of well-functioning markets, accompanied by sustained adoption and use of the new cooking technology, may have an unintended benefit of reducing gender gaps. Integrating gender-equality approaches (e.g., targeted measures to increase the number of women in fuel production or other areas of the value chain where they are severely underrepresented) can increase women's capacity for income generation, reduce household expenditures, and even change intra-household power relations. But these benefits are not automatic. Rather, they are sensitive to the business and program choices made and depend highly on the local context (Part 3). If executed wisely, they can help maximize

the degree to which pre-existing gaps between women and men may be reduced.

- **Leverage women’s power to achieve performance objectives.** Women are proving vital to the expansion of the clean cooking market through applying their household experience as users and managers of cookstove technologies and leveraging their social networks to effectively sell products. For example, Shankar, Onyura, and Alderman (2015) found that women outsold men by a factor of three when both groups were trained on empowerment-based agency. They also found that consumers who purchased cookstoves from women were more likely to use the stoves consistently and correctly. Women represent a large, untapped market to sell into, and when those purchases are financed (e.g., through microfinance institutions [MFIs]), female clientele often have better repayment rates.

## References

- Cecelski, E., and M. Matinga. 2014. *Cooking with Gas: Why Women in Developing Countries Want LPG and How They Can Get It*. Dublin: World LPG Gas Association (WLPGA).
- EIGE (European Institute for Gender Equality). 2012. *Review of the Implementation in the EU of Area K of the Beijing Platform for Action: Women and the Environment—Gender Equality and Climate Change*. Vilnius, Lithuania: European Institute for Gender Equality. <http://eige.europa.eu/sites/default/files/documents/Gender-Equality-and-Climate-Change-Report.pdf>.
- Goetz, A.-M. 1989. "Misbehaving Policy: A Feminist Analysis of Assumptions Informing a Project for Women Fish-smokers in Guinea." Paper presented to the Canadian Association of Africa Scholars Annual Meeting, Queen's University, Kingston, Ontario.
- Kammen. Daniel M. 1995. "Cookstoves for the Developing World." *Scientific American*, 273 (1): 72–75.
- Miller, G., and A. M. Mobarak. 2011. "Intra-household Externalities and Low Demand for a New Technology: Experimental Evidence on Improved Cookstoves." [https://www.cleancookingalliance.org/resources\\_files/intra-household-externalities.pdf](https://www.cleancookingalliance.org/resources_files/intra-household-externalities.pdf).
- Permana, Ariva Sugandi, Norsiah Abd. Aziz, and Ho Chin Siong. 2015. "Is Mom Energy Efficient? A Study of Gender, Household Energy Consumption and Family Decision Making in Indonesia." *Energy Research & Social Science* 6 (March): 78–86. <https://doi.org/10.1016/j.erss.2014.12.007>.
- Shankar, Anita, Mary Alice Onyura, and Jessica Alderman. 2015. "Agency-Based Empowerment Training Enhances Sales Capacity of Female Energy Entrepreneurs in Kenya." *Journal of Health Communication* 20: 67–75. <https://doi.org/10.1080/10810730.2014.1002959>.
- World Bank. 2015. *Stoves, Fuels, and Cooking Practices on Sumba Island, Indonesia: Findings and Recommendations of Qualitative Field Research*. East Asia and Pacific (EAP) Gender Facility and Clean Stove Initiative (CSI). Washington, DC: World Bank.



In Mozambique, Green 66 sales team members receive training on the benefits of bioethanol stoves and fuels.

© Mauro Vombe/Clean Cooking Alliance. Used with the permission of Mauro Vombe/Clean Cooking Alliance. Further permission required for reuse.



PART

2

## What Opportunities Can Empower Women?

3. Integrating Gender across the Value Chain
4. Financing
5. Enabling Policies and Market Support



In Maputo, Mozambique, a Green 66 ambassador describes the benefits of cooking with bioethanol fuel to a potential customer.  
© Mauro Vombe/Clean Cooking Alliance. Used with the permission of Mauro Vombe/Clean Cooking Alliance. Further permission required for reuse.

# 3 Integrating Gender across the Value Chain

Increasingly, clean cooking and heating initiatives offer a range of opportunities for contributing to women's socioeconomic empowerment. Women can benefit by leveraging their existing skills as traditional managers and users of household cooking and heating technologies, for instance, as co-designers of stoves or sales agents. They can also benefit from employment in non-traditional areas of the value chains as stove metal-workers, installers, and inspectors, among other roles. Figure 3.1 illustrates hypothetical pathways for gender integration in Efficient, Clean Cooking and Heating (ECCH) value chains and the outcomes that could be realized through this type of integration.

In reality however, women entrepreneurs often face a range of barriers to entering emerging value chains related to cook-stove and heating appliances. Compared to men, women may have lower financial literacy and access to finance (Klapper,

Lusardi, and van Oudheusden 2015). Because women tend to spend more of their incomes on consumables, they may have fewer durable assets than men for investing in their businesses. In addition, women may suffer from time poverty resulting from additional hours spent on unpaid household work.

This chapter provides a detailed discussion of opportunities for women's engagement across six stages of the clean stove product and service cycle: (i) design and testing, (ii) manufacture and assembly, (iii) wholesaling and distribution, (iv) marketing and retailing, (v) fuel supply and distribution, and (vi) after-sales service. Some stages feature overlapping opportunities (e.g., a distributor might be involved in direct sales and after-sales service or a manufacturer might also provide supplier or consumer finance). For each stage, the relevance of gender integration is interspersed with examples of initiatives that have successfully identified or optimized such opportunities.

**FIGURE 3.1** Promoting women's empowerment across the value chains

Involvement of women in ECCH value chains	Instruments of empowerment	Outcomes of empowerment
<ul style="list-style-type: none"><li>Leaders of organizations involved in the sector</li><li>Selection, design, and testing of products</li><li>Production of equipment or fuels</li><li>Distribution, retailing, and servicing</li><li>Financing of businesses or consumers</li></ul>	<ul style="list-style-type: none"><li>Employment</li><li>Income</li><li>Marketable skills</li><li>Business and social networks</li><li>Assets</li><li>Access to capital</li></ul>	<ul style="list-style-type: none"><li>Agency</li><li>Social status</li><li>Control over resources</li><li>Decision-making</li><li>Confidence</li><li>Autonomy</li></ul>

Source: Adapted from GACC and ICRW 2016.

## Design and Testing

Once outside the laboratory, cooking solutions become emmeshed in complex human behavioral patterns. Design and testing aim to optimize the theoretical and actual performance of cooking technologies (subject to relevant constraints) and often form an iterative cycle in the product development process. Including women and men in successive design stages can help tailor stove products and services to their habits and needs, ultimately contributing to successful adoption (photo 3.1).

Owing to their traditional roles as primary users and managers of cooking technologies, women's input in the design process is critical (box 3.1). In Kenya, for example, including women end-users' feedback led to the development of translucent LPG cylinders, which allowed for the visual monitoring of gas levels, thereby avoiding running out of gas without warning during meal preparation. The redesigned cylinders were also lightweight so that women could easily carry them. The success of the widely adopted Kenyan Ceramic Jiko has been attributed, in part, to co-design with women, who suggested widening the stove base to improve stability (Kammen 1995). In Lucknow, India, women's feedback on the Mina stove design resulted in modifications that improved affordability, combustion, and ease of use (by including an accessory for cooking *chapati*, a traditional flatbread) (Rouse 2002).

Stove testing informs product design (or selection) and also collects critical data related to performance and use that are helpful proxies when estimating impacts. Also, testing is sometimes necessary for government regulation of stove products. Technical tests for harmful emissions, fuel efficiency, heat transfer, and cooking times are typically undertaken in laboratory settings. These are complemented by field-based performance tests. Earlier stove programs that relied heavily on laboratory testing failed to achieve the anticipated performance levels

**PHOTO 3.1** Cooking-diaries study participants in Kenya



© Jon Leary/MECS. Used with the permission of Jon Leary/MECS. Further permission required for reuse.

### BOX 3.1

#### **Stove company's competitive strategy puts women's feedback front and center**

EcoZoom Ltd produces centrally manufactured stoves, which are distributed in Haiti, Kenya, Nigeria, Rwanda, Senegal, and Zambia, among other countries. To ensure women's concerns are integrated into its product design, the company follows a five-step process. It starts by assessing fuel consumption and expense patterns, meals cooked, pots used, and available options and impacts, among other variables. A functional prototype is then designed and tested in the laboratory. Once efficiency and emissions performance levels are considered acceptable, the stove is field-tested with women users to solicit their feedback. Women's feedback is ensured through single- and mixed-gender focus group discussions (FGDs), controlled cooking tests (CCTs), home trials, and stove pilots.

Based on the women's feedback and co-design, EcoZoom modifies the stove without compromising effi-

cency and emissions. Engineering drawings based on the modified design are made, and the stove is manufactured. EcoZoom then pilots 100–500 units. It also holds one-on-one discussions with users to solicit feedback (both positive and negative) for further product improvement. As of 2014, more than 230 women had participated in the company's product design process.

In Mexico, women's feedback was used to improve the durability, safety, and convenience of EcoZoom stoves (i.e., by adding accessories that included solid slates with silicon handles and a tray to improve ash removal). By 2014, the company had moved from piloting 10,000 stoves to selling more than 22,000 units. Women's feedback was also instrumental in helping EcoZoom select Kenya as the lead market for its product and develop locally relevant brand names in Kenya, Mexico, Nigeria, and Rwanda.

Source: EcoZoom 2013.

in the field. User acceptability testing conducted in the field is critical for understanding what users—usually women—like and do not like about the new technology. Such acceptability studies allow stove programs to select the stoves that women and men would actually use and not just the ones that perform well under controlled conditions (box 3.2).<sup>1</sup>

## Manufacture and Assembly

Both artisanal and factory production of stove technologies and fuels present an opportunity for women's integration into the clean-cooking value chain. At present, however, women are underrepresented, particularly in factory production. As artisans, women tend to focus on making clay liners, leveraging their traditional role as ceramicists (box 3.3).

### BOX 3.2

#### Improving stove-user acceptability in Cambodia and Indonesia

Two recent World Bank–financed projects in Southeast Asia—the Cambodia Supporting Self-Sustaining Commercial Markets for Improved Cookstove and Household Biogester and the Indonesia Clean Stove Initiative (CSI)—demonstrate the value of engaging women in stove design and testing under real-life conditions. By acquiring comprehensive and systematic feedback from women stove users, these projects were better able to integrate gender dimensions and improve product acceptability and use.

##### Women's participation in design and testing

In Cambodia, via the implementing agency GERES (Groupe Energies Renouvelables, Environnement et Solidarites), women participated in the design, development, and testing of the Neang Kongray stove. In the Indonesia CSI, women were involved in the design and testing of 2 of the 10 stove types promoted, the Keren Super 2 and the Supra Anglo, as well as 8 privately developed stoves. A multidisciplinary team comprising a sociologist, anthropologist, and statistician conducted in-depth interviews; led focus group discussions (FGDs); and developed case studies to understand sex-disaggregated views about stove preferences and use, fuel consumption, and cooking habits and sequences.

Both projects carefully observed how women interacted with the stoves and fuels during cooking and conducted in-depth interviews with them. Also, a quantitative survey was administered to supplement the findings from

Social norms and hesitancy of past programs to challenge gender roles in the production, assembly, and installation of clean cooking and heating solutions mean that women often miss out on jobs with higher earning potential. Gender gaps persist especially in sheet metalworking, welding, and soldering; masonry for building biogas plants; and assembly of boilers/furnaces and solar water heaters; among other areas. Emerging best practices in integrating more women into traditionally male-dominated trades include identifying women's existing skills that can be leveraged to facilitate their entry into clean stove production, while, at the same time, supporting their pursuit of new skills and opportunities (photo 3.2, box 3.4).

Promoting gender-equal employment opportunities and women-friendly workplace environments is an opportunity for closing the gender gaps in the clean cooking sector (box 3.5).

the qualitative studies. In both cases, observational data were collected in advance to inform the new stove designs.

##### Key findings

Researchers observed that the types of foods normally cooked and consumed influenced how women interacted with and operated the stoves during the cooking period. They often started by preparing the part of the meal requiring low heat, followed by food requiring higher heat and then food to be simmered.

Many women were concerned about how long the stove could operate unattended during food preparation so they could perform other cooking-related tasks (e.g., chopping vegetables in between heat cycles). They were also concerned about how well the pots fit the stovetop and how the stove and smoke/soot may affect the pots. In addition, they were concerned about how the ashes affected air flow. Unlike gas stoves, biomass stoves require constant fuel adjustments in the combustion chamber to achieve or maintain the desired heating power.

Multiple factors—ranging from the cooking methods and types of foods cooked for any meal to the working life of the stove, fuel-use rate, emissions, heating efficiency, heating power or level, and speed of lighting—were found to influence how a stove design worked for these women. Design changes were made to meet all of these contextual concerns, which improved women's acceptability and uptake.

Sources: Tuntivate 2017; World Bank 2015.

### BOX 3.3

#### Adapting production methods and training to fit women's needs

Training women artisans in the production of the Neang Kongray improved ceramic stove was a key component of the World Bank–financed project, Cambodia: Supporting Self-Sustaining Commercial Markets for Improved Cook-stove and Household Biogester. Experienced in making traditional ceramic pots and cookstoves, the women artisans received training in the technical aspects of the new stove design, quality control, and production standards (e.g., clay mixing, molding, and kiln firing), as well as business management and marketing. During the pilot

phase (August 2007–July 2008), 10 women completed the training, producing approximately 2,000 Neang Kongray improved stoves, all of which met the technical standards. Lessons from the pilot were used to expand training at other production and training facilities throughout the country. The project's initial plan to establish a joint training and production facility was changed when the women indicated that working from home would allow them greater flexibility. Thus, the joint training and production facility became the training center only.

Source: ASTAE 2010.

#### PHOTO 3.2 Factory employee at BURN Manufacturing's Nairobi facility



© Jon Leary/MECS. Used with the permission of Jon Leary/MECS. Further permission required for reuse.

#### Wholesaling and Distribution

Wholesaler and distribution channels are vital to the sustainability of clean stoves markets. Depending on the enterprise type and size, products and services can be funneled from manufacturers to agents and retailers, who then sell them to consumers, or purchased directly if locally produced. Distribution usually requires some level of product and customer knowledge; possible familiarity with import and customs procedures; and a handle on transport/logistics, warehousing/storage, and inventory tracking. Women are comparatively underrepresented in larger-scale wholesaling and distribution operations owing to such factors as the higher capital requirements, lack of familiarity with professional networks related to imports and supply-chain logistics, and perceived shortage of skills. Supporting women requires facilitating access to finance and information, skills development, and confidence building.

In rural areas, where poor road infrastructure and dispersed populations can raise distribution costs considerably, hiring or otherwise engaging men to assist with transporting goods on behalf of women can be a winning strategy. The Indonesia CSI, for example, found that women in rural areas were at a disadvantage when trying to maneuver motorbikes loaded with bulky stoves (World Bank 2018). Kopernik found that women micro-entrepreneurs in rural Indonesia whose spouses provided transporting assistance were more effective in reaching distant markets (Baranova 2017) (box 3.6).

Opening up more income-generating opportunities for women in wholesaling and distribution could impact downstream supplier relationships, as well as create more women-friendly, business-to-business relationships. Distributors can make logistical arrangements to facilitate women's participa-

**BOX 3.4**

### Empowering female biogas masons: Lessons from a pilot project in Vietnam

SNV Netherlands Development Organisation has promoted household biogas in Vietnam since 1992. Over a 12-year period, the National Biogas Program (NBP) trained more than 1,700 masons; however, less than 0.2 percent were female. To address this gender imbalance, SNV and NBP piloted a program to support women's inclusion in biogas systems supply. The first step was to conduct a gender analysis to understand the barriers to women's entry into biogas construction. Based on the results, SNV and the NBP identified women already working as masonry assistants for training in biogas construction. Because of social norms discouraging women from being away from home, SNV and NBP enabled these women to select a partner (e.g., husband, family member, friend, or other acquaintance) to attend the training with them.

A gender-sensitive training module was developed that took women's lower experience level with masonry and biogas entrepreneurship into consideration. Women trainees appeared to lack confidence and take longer than their

male counterparts in mastering the technical aspects of biodigester construction. After eight days of coaching, all nine men trainees expressed confidence in becoming biogas technicians, while all nine women trainees requested an additional five days of coaching. All men and women trainees received an additional three days of coaching on biogas piping and appliances, and training sessions were also held on business development and effective skills in product sales.

Subsequent to training, eight biogas masonry enterprises were established, seven of which were women-led. Female lead masons earned an average of US\$18 per day and assistant masons about US\$10. Although the women had a lower daily rate than the men (male lead masons earned US\$20 and assistant masons US\$15), these new incomes were critical additions to their family earnings. Women masons were found to be more careful with detailed work, produce better-quality digesters, and have more satisfied users, thereby contributing to the program's success.

Source: SNV n.d.

**BOX 3.5**

### Breaking gender norms is a "win-win" for a stove-company facility in Kenya

BURN Manufacturing's overall mission is to save lives and forests in the developing world by designing, locally manufacturing, and distributing clean-burning cookstoves. In 2013, the company launched its Jikokoa stove assembly facility in Kenya, initially sourcing kits made by a contract manufacturer in China. By late 2014, the full in-country facility was opened. The company makes about 550

stoves a day and sells 10,000 units per month. Jobs focus on low-skilled factory work, with equal opportunity for all employees, more than half of whom are women. The facility promotes safe and healthy working conditions, and employee benefits include maternal leave, loans, and ample opportunity for promotion.

Source: EEP Africa 2015.

tion as retail agents. With greater gender balance on their management teams, wholesalers and distributors might be more clued in to the barriers women retailers face and better able to respond appropriately. Also, since many supplier relationships are based on mutual trust and historical relationships (ASTAE 2013), women-led wholesalers and distributors might be better positioned to activate retailer networks with similarly high female participation.

Tapping into pre-existing apex groups with significant female membership has been effectively used by development projects and social-enterprise ventures to include women in this market segment (box 3.7). The approach has succeeded with self-help groups in India (box 3.8), women's village banks in Malawi, women's health-promotion groups in Nepal, and tea cooperatives in Kenya, among many others. Such networks can serve as a source of customers, as well as a hub-and-

**BOX 3.6**

### Social enterprise supports female micro-entrepreneurs by coordinating logistics

Kopernik is a social enterprise that aims to increase access to life-changing, affordable technologies by people living in remote parts of the world. Among the solutions offered are clean cookstoves. To support women's inclusion in Indonesia's clean cookstove value chains, Kopernik's Wonder Women project, launched in 2015, consolidates product shipments to remote locations, where women

can collect inventory for onward distribution. Through this arrangement, the women minimize logistics costs (e.g., supply negotiations, transport, and warehousing), which otherwise would significantly increase their cost of doing business. As of April 2018, 535 Wonder Women participants had sold 55,280 stoves and small solar-lighting technologies.

Source: Polla 2018.

**BOX 3.7**

### World Bank project experience with women's wholesaler groups

The Second Sustainable and Participatory Energy Management Project (PROGEDE II) in Senegal stands out as the only World Bank-supported project under the Efficient, Clean Cooking and Heating (ECCH) Program that established clear linkages between gender and wholesaling in its project documents. As part of the project, local women's groups and associations were responsible for placing bulk orders for improved cookstoves with stove makers and selling them at a profit to their members. Utilizing the

women's groups and associations as part of the wholesale and retail supply chain was a natural fit as the project had already been working with local women on community-based forest and fuelwood management. The project assisted participating women's groups and associations in securing credit from local microfinance institutions (MFIs). By the end of March 2017, the project had commercially disseminated 700,000 improved cookstoves, some 300,000 units above the project's target.

Source: Hammond et al. 2015.

**BOX 3.8**

### Community-based organization leverages women's network for product distribution

In 2003, Jagriti, a community-based organization (CBO) located in India's Kullu District of Himachal Pradesh, began introducing clean fuels and cooking technologies, leveraging the Women's Savings and Credit Groups (WSCGs) it had established two years earlier as distributors. The CBO engaged WSCG members to distribute efficient water heaters, pressure cookers, and LPG stoves. In the program's

first phase (2002–09), the women distributed 539 water heaters, 207 pressure cookers, and 383 LPG stoves in the remote Lag Valley, which typically is not reached by such technologies. By 2011, Jagriti was working with a network of more than 130 WSCGs, reaching 1,400 women members with LPG fuel and improved cooking technologies.

Sources: Hart and Smith 2013; UNDP 2011.

spokes model for distribution.<sup>2</sup> If already involved in financing activities, the organizations concerned may be well positioned to simultaneously address the affordability constraints of users and micro-entrepreneurs (chapter 4).

## Marketing and Retailing

Retailing of clean cooking or heating solutions involves sourcing a product or service from the manufacturer, wholesaler, or distributor; managing inventory (e.g., based on the cost of storage or available storage and sales, deciding how much of a particular product to stock, or recording sales and returns); and marketing, including selling at appropriate price points (e.g., balancing profitability and competitiveness).

### Women-Centered Business Models

Many clean stoves projects and business models have built their marketing and retail networks around women. Some consider women uniquely placed to excel at this work owing to their closeness to the final customer. Others believe marketing and retailing are more amenable to women's participation because of the flexibility offered in work location, ability to combine such activities with already existing businesses, and lower capital requirements.

However, establishing women-centered, rural retail networks for clean stove technologies also runs the potential risk of market saturation. Owing to social norms, lack of

transportation, and other infrastructure constraints, women in many rural areas have more limited mobility than men (Uteng 2011).<sup>3</sup> Many projects or companies use the stable presence of women in remote rural areas to build out their retail networks (box 3.9). Such companies as Kopernik and Dharma Life have observed that, after a few years, many of these women exhaust their geographic market, suggesting the need for longer-term strategies when establishing such networks.

### Awareness-Building Techniques

Cooking demonstrations can help women overcome their anxiety about switching cooking devices by allowing them to freely interact with the technology and express their concerns. Having a woman conduct field demonstrations may lower communication barriers and encourage more interaction among the women. Targeting a specific group of women, such as mothers, has also been demonstrated as an effective way of increasing uptake (Evans et al. 2020). The demonstrations can also help men, especially those responsible for balancing household budgets, to overcome their reluctance to purchase clean cooking solutions. The demonstrations raise awareness of and interest in the touted benefits of the technologies (e.g., fuel, cash, and time savings). To achieve a wider reach, field demonstrations can be broadcast through the mass media as part of a publicly supported awareness-raising campaign strategy for multiple forms of technologies and fuels (box 3.10).

### BOX 3.9

#### Private spinoff company supports rural women retailers through capacity building, wholesaler services, and logistics

Sakhi Retail Private Limited (SRPL), a distribution network created by Self-Education for Empowerment (*Swayam Shikshan Prayog*), an Indian nongovernmental organization (NGO), empowers rural women through economic opportunities and networks that reach the poor with appropriate solutions. SRPL includes poor women as retailers of cookstoves and biomass pellets. It selects women from "the top of the bottom of the pyramid;" that is, those who are likely to have some income and capacity to engage in businesses. It then tests these women's entrepreneurial skills by observing their sales volume and moti-

vation over several months, after which the women are provided training, coaching, and, in some cases, compensation. SRPL then buys cookstoves at negotiated prices, bears their transport cost from the warehouse to villages, and delivers them to the Sakhi women, who onsell them and earn a commission. SRPL maintains decentralized warehousing infrastructure, with at least three separate facilities, to bring products closer to its retailers. As a result of this strategy, 400 women earn incomes as cookstove distributors, reaching 700 villages and 70,000 households in Maharashtra.

Source: Hystra 2013.

Trial periods can aid women stove users to manage the perceived risks of switching to clean cookstoves (Miller and Mobarak 2011). These risks are both financial (e.g., whether the expected fuel savings could be realized or the loan repaid) and nonfinancial (e.g., concerns about effective use of the product or possible changes in the taste of foods) (photo 3.3). During the trial period, women can try out the new technology to understand its functionality while husbands and other family members can gain assurance of the product's benefits and value before reaching a purchase decision (box 3.11).

**Women-to-women marketing** entails one woman with knowledge (and preferably stock) of specific clean cooking technologies talking with other women about the products and marketing them. This has been an effective strategy for multi-million-dollar global corporations and poverty reduction initiatives alike. The approach has been successfully used in such diverse sectors as cosmetics (Avon Corporation), kitchenware (Tupperware Brands Corporation), and solar products (Solar

**PHOTO 3.3** Agnes from Jikoni Magic leads bi-weekly class on making everyday meals with the electric pressure cooker.



© Jon Leary/MECS. Used with the permission of Jon Leary/MECS. Further permission required for reuse.

#### BOX 3.10

### Clean cooking TV and radio series reaches millions of viewers in Kenya

*Shamba Chef*, a popular TV show in Kenya, which aired in 2017, shared practical tips on improving families' kitchens and diets, utilizing cook-offs, kitchen makeovers, and recipes demonstrated by popular Kenyan chefs. Each episode featured real-life Kenyan families learning how to prepare more nutritious meals and trying out improved stoves and fuels. The series was broadcast on Citizen TV, Kenya's most popular TV station. Available in English and Swahili, *Shamba Chef* had more than 3.2 million viewers every week. Each episode was adapted for radio, which attracted 5 million listeners weekly. Audiences could also subscribe to a free, interactive mobile platform, called *iChef*, to access more information, including nutritious recipes and ongoing advice on clean cooking. Families exposed to *Shamba Chef* were four times more likely to be aware of cleaner cooking options. The program was produced by The Mediae Company with the support of the Clean Cooking Alliance.

Sources: CCA 2021; Evans et al. 2020.

#### BOX 3.11

### Demonstrated cash savings reduces perceived risk of product adoption

Toyola Energy Limited, a company in Ghana that manufactures and sells energy-efficient cookstoves in urban and rural areas, offers customers the option of a 30-month trial period, which includes use of a simple device that tracks the amount of fuel used. Designed like a piggy bank, the device, called the Toyola Box, consists of a tin can with a slot cut in the top and a label. Each day during the trial period, customers deposit the difference between their previous and current charcoal expenditures into the box. After the 30 days, the sales agent returns and opens the box together with the customer. Virtually all customers want to keep the stove, and many insist on keeping the Toyola Box.

Source: Hystra 2013.

Sisters). The Indonesia CSI found that women were more likely to sell stoves to female customers, possibly because of better relatability (World Bank 2018). Shankar, Onyura, and Alderman (2015) found that women who purchased improved cookstoves from other women instead of men were more likely to use the stoves consistently and correctly and recommend the technology to others.

Men's engagement in information dissemination can be an effective way to overcome hesitancy to switch to clean stove technologies and fuels, depending on social norms in the project area (box 3.12).

**Mobile marketing**, which promotes goods and services using mobile phones and other handheld devices, has been found effective in regions where it has been tried. Mobile marketing can help women entrepreneurs surmount the problems of limited mobility and advertising budgets as simple applications can be used to reach thousands of people within a short time.

**Product bundling** mitigates the risks associated with dependence on one product line by enabling entrepreneurs to sell other products along with the clean stove technologies, which can attract additional customers. For Eco Fuel Africa's network of 580 women retailers (most of them previously unemployed), product bundling in kiosks made it possible for them to earn US\$152 per month (Hart and Smith 2013). In Ghana, the

**PHOTO 3.4** Sales staff of Emerging Cooking Solutions in Lusaka, Zambia



© Energy and Environment Partnership in Southern and East Africa. Used with permission of the Energy and Environment Partnership in Southern and East Africa. Further permission required for reuse.

### BOX 3.12

#### Men's role in promoting widespread stove adoption in Honduras

A study in Honduras documents how men played a crucial role in disseminating information on improved cookstoves (ICS) across a large part of western Honduras, which led to the successful adoption of the LE2X3 model. The stove program, called Proyecto Mirador, relied on word-of-mouth to diffuse positive information to residents in far-off communities.

The dissemination model consisted of two stages of decision-making among adopters, both of which involved information exchange across existing social networks. In the first stage, a community member learned of the stove and submitted a written solicitation requesting the project to install units in his or her community. The solicitation included the names of 10 or more interested community members. In the second stage, the project sent an imple-

menter to the community to hold a workshop at which the stove was formally introduced to the attendees, including those contacted during the original solicitation and other interested individuals. At the end of the workshop, the list of those interested in adopting the stove was finalized and installation arrangements were made.

Because of the society's patriarchal nature, men communicated with other men more readily than women did. Also, the men were more active in disseminating stove information, covering longer distances than could women (greater than 30 km), and were more likely to talk to women about the stoves than vice versa. The project is reported to have installed more than 40,000 units in communities located up to 150 km away from its base of operations, with no investments in formal marketing.

Source: Ramirez et al. 2014.

Health Keepers Network applies a product bundling approach. By diversifying their product line to include health items that women tend to purchase, women entrepreneurs reduce their business risk while placing cookstoves within easy reach of their female customers. Product bundling can also be done at the design phase, as exemplified by cookstove designs that include a USB phone-charging port. One study found that access to USB charging ports significantly increased adoption of the cookstoves, but only among women, contrary to the expectation that they would be appreciated by men (Wilson et al. 2018).

#### Checklist for Effective Promotion Strategies

✓ Consider the sociodemographic characteristics of the target group. Stove adopters differ by sex, as well as age, education, locality (rural or urban), social status, and other variables that influence how they receive and internalize cookstove information. Gender disparities persist in education and, according to UNICEF (2020), girls are more likely to be disproportionately disadvantaged in countries that have not reached gender parity (in Africa, the Middle East, and South Asia). A recent systematic review by ESMAP (2021) reveals the high degree of learning necessary when introducing stoves and fuels that differ substantially from the

baseline technologies (box 3.13). Thus, characteristics of the target group should be taken into account when designing a stove marketing strategy, and appropriate modes of disseminating information should be utilized. For example, the *Samba Chef* series illustrates how to apply mass communication tools to reach a heterogeneous audience (box 3.10).

- ✓ Consider door-to-door marketing and promotion. This approach can work especially well for beneficiaries with lower literacy levels (box 3.13). It can also be used as a means of reinforcing information disseminated through other modes of communication.
- ✓ Respect women's time constraints. Marketing techniques should consider the time constraints women face, which could be overcome by door-to-door marketing or holding promotional events on market or clinic days, when women and men are already attending other activities.
- ✓ Engage both women and men through targeted communication activities. For example, single-gender focus group discussions (FGDs) can discover whether and how men and women differ in their responses to messages (box 3.14). Having a mixed gender team at the point of sales can overcome such challenges (photo 3.4).

#### BOX 3.13

#### Overlooking literacy can adversely impact stove transitions

Many cookstove programs have included training, education, and awareness-raising activities in their design, but how effective were they? A recent evidence synthesis by the World Bank's Energy Sector Management Assistance Program (ESMAP) finds that the training provided by many cookstove programs was one-off and failed to consider the literacy levels of the target beneficiaries. For example, a follow-up evaluation of a solar cookers program in South Africa revealed that stoves had fallen into disuse because participants who had earlier received the training had forgotten how to use the technology. Other programs that provided training materials (e.g., in Bangladesh, Guatemala, and India) presumed that participants had the required literacy level to comprehend the contents. However, an evaluation of one of those programs found that only 39 percent of the beneficiaries considered the training manuals helpful.

Source: ESMAP 2021.

#### BOX 3.14

#### Focus group discussions reveal gendered perceptions of clean cooking solutions

A recent study conducted in Northern Kenya compared and contrasted men's and women's perceptions about clean cooking solutions. Six focus group discussions (FGDs) were held with 23 married couples, who were divided into two single-gender groups. Despite acknowledging problems associated with the use of traditional cookstoves, the men's group did not prioritize tackling the issue. In their view, women were the "fire experts" and were used to cooking with traditional stoves. The men's perception was in stark contrast to that of the women, who wanted to solve the problem but were limited in their ability to act because the men controlled household expenditures. The study recommended targeting both groups with cookstove information and creating opportunities for open dialogue between men and women on cookstove-related challenges.

Source: Ochieng et al. 2021.

## Fuel Supply and Distribution

The scope for increasing women's engagement in clean cooking and heating can be extended beyond the stove supply chain to include fuel supply and distribution. Value-chain opportunities include the production of more efficient and sustainable processing, distribution, and use of charcoal, biomass pellets, ethanol, and liquefied petroleum gas (LPG) (photo 3.5).

Some studies suggest that women's engagement in the fuel supply sector is more likely when capital requirements are lower. This was the conclusion of Kariuki and Balla (2012), who surveyed 885 energy microenterprises under the Developing Energy Enterprises Programme-East Africa (DEEP-EA) supported by Energy 4 Impact (formerly the Global Village Energy Partnership). Overall, 42 percent of the microenterprises were women-led; however, women microenterprises represented 62 percent of briquette manufacturers and retailers. Conversely, men were overrepresented in businesses with higher start-up capital requirements (e.g., photovoltaics and biodigesters).

**PHOTO 3.5** Working on an innovative retort kiln for improved charcoal production in India



© Chris Adam. Used with the permission of Chris Adam. Further permission required for reuse.

### BOX 3.15

#### Nepal improved charcoal project recruits women in training and business creation

Charcoal production in Nepal typically occurs in an unsustainable manner, and is considered a job for poor, low-caste men. The Nepal Bio-Energy Project manages forests by removing invasive plant species and using them to produce charcoal, which is then sold to private companies, institutions, and households, creating lucrative business opportunities. To facilitate women's entry into the char-

Out of 14 World Bank–financed projects in 1989–2017 that focused on solid fuel supply and community-based forest resource management, 11 involved women in fuel production and sustainable management (Tuntivate 2017) (box 3.15). Perhaps the most notable one was PROGEDE II in Senegal (box 3.7), which supported the entry of more than 1,000 women into the traditionally male occupations of charcoal production and wholesaling. Not only did women's involvement go hand in hand with more environmentally sustainable production practices; women were empowered to take more active roles in community governance issues.

However, women need not be excluded from more capital-intensive, fuel supply sectors (e.g., LPG). In Ghana, for example, 6 out of 42 LPG distribution points were run by women in 2015 (Matinga 2015). Lessons from such exceptional cases are worth highlighting (box 3.16).

## After-Sales Support

Providing after-sales support services can create a positive buying experience for customers, avoid products going into disuse, and ensure the continuous flow of information between users and product developers, which is vital to building sustainable markets. Warranties provide customers a guarantee that their new stove product will be repaired or replaced if it breaks down or becomes ineffective within a specified period or under certain use conditions. Along with trial periods (box 3.11), warranties help stove users manage the risks associated with switching to cleaner cooking solutions. Existing evidence shows that, after adoption, users' challenges with the new technologies can lead them to make modifications that compromise stove performance (ESMAP 2021). After-sales courtesy visits, repair services, and phone lines to handle customer questions and complaints can avoid many of these issues.

coal production business, the project provided a five-day training class in charring technology and processes. One successful approach used the first two women trainees as role models for recruiting other women. As of March 2017, women comprised 40 percent of the 1,274 trainees. Of the 1,100 trainees that went on to establish charcoal production businesses, 440 were women-led.

Source: European Commission 2017.

**BOX 3.16**

### Women-led, niche LPG businesses in Ghana advance with the right support

Under the African Rural Energy Enterprise Development (AREED) program, two women-run liquefied petroleum gas (LPG) companies in Ghana, M38 and Lambark, applied for and received loans totaling hundreds of thousands of dollars to grow their businesses. The entrepreneur behind M38 had noticed that her neighbors traveled across town and waited in long lines to refill their LPG cylinders. Her solution was to open a filling station in her Accra neighborhood. Lambark's entrepreneur, located in Kumasi, knew that customers in the surrounding areas spent much time traveling to the city to obtain LPG, so her distribution company launched a motorbike delivery service. AREED provided business development support and affordable capital (5–8 percent, dollar denominated), which enabled these women to address compelling needs they identified in the LPG market.

Source: Haselip et al. 2013.

After-sales support includes various actors along the value chain. Last-mile distributors may be first-line for handling troubleshooting inquiries and product returns, while a national-level manufacturer or wholesaler may offer and honor warranties and coordinate repairs and replacements. Microfinance institutions (MFIs), who recognize the influence of after-sales service quality on default rates, may insist on having service agreements in place before lending or take a more active role in providing the technology and monitoring customer satisfaction.

The design of after-sales support should take a gender-responsive approach (photo 3.6). This means interacting with male and female customers to support their product needs, providing opportunities for both men and women to work in after-sales service, and being sensitive to local gender norms. In community contexts where male service providers are prohibited from entering a home where women are alone, women consumers can be trained in how to maintain and repair their own stoves or other women can be trained to provide such services (ESMAP 2021).

The engagement of women community members in after-sales service has, in some cases, reduced associated

**PHOTO 3.6** Circle Gas/M-Gas support staff member inspecting LPG cylinders



© Daniel Mutema/Clean Cooking Alliance. Used with the permission of Daniel Mutema/Clean Cooking Alliance. Further permission required for reuse.

transaction costs (Gold Standard 2016).<sup>4</sup> As traditional managers of household cooking and heating, women may be better positioned to obtain feedback from women end users and support their consistent use of the new technologies. Use of mobile phones can facilitate women's communication with their customers, thereby reducing unnecessary, costly visits. In India, for example, purchasers of the Oorja cookstove in Maharashtra and Bihar states can access the women stove sellers by phone, which ensures a quick response to their questions. Similarly, in Uganda, LivingGoods uses a mobile platform to increase the accessibility of its micro-franchises for after-sales support.

### Notes

1. Strides have been made in integrating women's feedback in stove field-testing; however, the inclusion of women professionals in conducting field tests remains low and is thus an area for narrowing the gender gap.
2. In a hub-and-spokes model, a manufacturer or main distributor (e.g., importer) contracts a super stockist to receive goods and dispatch them to sub-distributors who, in turn, supply the goods to retailers, then on to consumers.
3. Social norms are said to be the main constraint to women's mobility, including the appropriateness of women and girls riding bicycles, driving cars, or traveling alone outside their villages. Many of these norms are rooted in conceptions about female virginity, "honor," and women's capacity to operate heavy machinery. Many modes of transportation are expensive, inconvenient for individuals traveling with children or elderly family members, and/or expose women and girls to sexual harassment.
4. The examples documented by Gold Standard (2016) include Bolivia's Center for Development with Solar Energy, which promotes clean cooking through its innovative leaders program and India's Sakhi Unique Rural Enterprise, a last-mile distribution company that engages women entrepreneurs in sales and after-sales service.

## References

- ASTAE (Asia Sustainable and Alternative Energy Program). 2010. *Cambodia Supporting Self-Sustaining Commercial Markets for Improved Cookstoves and Household Biogesters*. Washington, DC: World Bank.
- ASTAE (Asia Sustainable and Alternative Energy Program). 2013. *Indonesia: Toward Universal Access to Clean Cooking*. East Asia and Pacific Clean Stove Initiative Series. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/105441468044144806/pdf/792790ESW0P1290ox0377371B00PUBLIC00.pdf>.
- Baranova, Anna. 2017. "Better Sales Performance Achieved When Spouses Get Involved, But Not Too Much." K-Insights, April 11. <https://kopernik.info/en/insights-reports/kinsights/better-sales-performance-achieved-when-spouses-get-involved,-but-not-too-much>.
- CCA (Clean Cooking Alliance). 2021. "Shamba Chef—Kenya." Behavior Change Communication (BCC) Resource Hub. Washington, DC: Clean Cooking Alliance. <https://www.cleancookingalliance.org/market-development/demand-creation/campaign/shamba-chef-kenya.html>.
- EcoZoom. 2013. "Designing with Women: The EcoZoom Approach to Product Design (blog), November 6.
- EEP Africa. 2015. "BURN Breaks Gender Roles in Kenya and Sells 10,000 Cookstoves Monthly." News, November 5. <https://eepafrica.org/burn-breaks-gender-roles-in-kenya-and-sells-10000-cookstoves-monthly/>.
- ESMAP (Energy Sector Management Assistance Program). 2021. *What Drives the Transition to Modern Energy Cooking Services?: A Systematic Review of the Evidence*. ESMAP Technical Report 015/21. Washington, DC: World Bank Group. <http://documents.worldbank.org/curated/en/518251613714281312/What-Drives-the-Transition-to-Modern-Energy-Cooking-Services-A-Systematic-Review-of-the-Evidence>.
- European Commission. 2017. *Up-scaling the Production and Consumption of Bio-energy to Reduce Carbon Emissions and Enhance Local Employment in Nepal*. Brussels: European External Action Service.
- Evans, William Douglas, Bonnie N. Young, Michael A. Johnson, Kirstie A. Jagoe, Dana Charron, Madeleine Rossanese, K. Lloyd Morgan, Patricia Gichinga, and Julie Ipe. 2020. "The Shamba Chef Educational Entertainment Program to Promote Modern Cookstoves in Kenya: Outcomes and Dose–Response Analysis." *International Journal of Environmental Research and Public Health* 17 (1): 162. <https://doi.org/10.3390/ijerph17010162>.
- GACC and ICRW (Global Alliance for Clean Cookstoves and International Center for Research on Women). 2016. *Measuring Social Impact in the Clean and Efficient Cooking Sector: A How-to Guide*. Washington, DC: Global Alliance for Clean Cookstoves. <https://www.cleancookingalliance.org/binary-data/RESOURCE/file/000/000/489-1.pdf>.
- Gold Standard. 2016. "Gold Standard Improved Cookstove Activities Guidebook: Increasing Commitments to Clean-Cooking Initiatives." [https://www.goldstandard.org/sites/default/files/documents/gs\\_ics\\_report.pdf](https://www.goldstandard.org/sites/default/files/documents/gs_ics_report.pdf).
- Hammond, A., I. Schomer, A. Ngom, A. Seck, and V. Lopes Janik. 2015. "Improving Gender Equality and Rural Livelihoods in Senegal through Sustainable and Participatory Energy Management: Senegal's PROGEDE II Project." *Live Wire* 2015/40. World Bank, Washington, DC. <https://openknowledge.worldbank.org/handle/10986/22111>.
- Hart, Corinne, and Genevieve Smith. 2013. "Scaling Adoption of Clean Cooking Solutions through Women's Empowerment." Resources, September 25. <http://cleancookstoves.org/resources/223.html>.
- Haselip, James, Denis Desgain, Gordon A. Mackenzie, and Climate and Sustainable Development UNEP Risø Centre on Energy. 2013. *Energy SMEs in Sub-Saharan Africa: Outcomes, Barriers and Prospects in Ghana, Senegal, Tanzania and Zambia*. Roskilde, Denmark: UNEP Risø Centre. [http://orbit.dtu.dk/files/56433833/Energy\\_SMEsin\\_Sub\\_Saharan\\_Africa\\_full\\_Report\\_May\\_2013.pdf](http://orbit.dtu.dk/files/56433833/Energy_SMEsin_Sub_Saharan_Africa_full_Report_May_2013.pdf).
- Hystra. 2013. "Marketing Innovative Devices for the BOP." Paris: Hystra. [https://static1.squarespace.com/static/51bef39fe4b010d205f84a92/t/57d014976a49630231034279/1473254596574/Marketing+Innovative+Devices+for+the+BOP\\_Full+report.pdf](https://static1.squarespace.com/static/51bef39fe4b010d205f84a92/t/57d014976a49630231034279/1473254596574/Marketing+Innovative+Devices+for+the+BOP_Full+report.pdf).
- Kammen, Daniel M. 1995. "Cookstoves for the Developing World." *Scientific American*, 273 (1): 72–75.
- Kariuki, Phyllis, and Patrick Balla. 2012. "GVEP'S Experiences with Working with Women Entrepreneurs in East Africa." GVEP International in East Africa. London: Energy4Impact. <https://www.energy4impact.org/file/1716/download?token=Gq71yjaq>.
- Klapper, L., A. Lusardi, and P. van Oudheusden. 2015. "Financial Literacy around the World: Insights from the Standard & Poor's Ratings Services Global Financial Literacy Survey." [https://gflec.org/wp-content/uploads/2015/11/Finlit\\_paper\\_16\\_F2\\_singles.pdf](https://gflec.org/wp-content/uploads/2015/11/Finlit_paper_16_F2_singles.pdf).
- Matinga, M. N. 2015. "LPG: Increasing the Energy Options Benefiting Women Worldwide." *ENERGIA News*, Vol. 16, Issue 1. <https://www.energia.org/latest-energia-news-lpg-increasing-the-energy-options-benefiting-women-worldwide/>.
- Miller, G., and A. M. Mobarak. 2011. "Intra-household Externalities and Low Demand for a New Technology: Experimental Evidence on Improved Cookstoves." [https://www.cleancookingalliance.org/resources\\_files/intra-household-externalities.pdf](https://www.cleancookingalliance.org/resources_files/intra-household-externalities.pdf).
- Ochieng, C. A., U. Murray, J. Owuor, and C. Spillane. 2021. "The Forgotten Half: Men's Influence over Cookstove Adoption Decisions in Northern Kenya." *Energy Research & Social Science* 74 (April): 101913. <https://doi.org/10.1016/j.erss.2021.101913>.
- Polla, Enrico. 2018. "Kopernik's Experience Empowering Women Entrepreneurs in the Last Mile in Indonesia." PowerPoint Presentation, June 8. <https://mk0asiacleanenejfkwc.kinstacd.com/wp-content/uploads/2018/06/Enrico-Polla-Kopernik%2E%20%99s-Experience-Empowering-Women-Entrepreneurs-in-the-Last-Mile-in-Indonesia.pdf>.
- Ramirez, S., P. Dwivedi, A. Ghilardi, and R. Bailis. 2014. "Diffusion of Non-traditional Cookstoves across Western Honduras: A Social Network Analysis." *Energy Policy* 66: 379–89. <https://doi.org/10.1016/j.enpol.2013.11.008>.
- Rouse, Jonathan. 2002. "Community Participation in Household Energy Programmes: A Case-Study from India." *Energy for Sustainable Development* 6 (2): 28–36.
- Shankar, Anita, Mary Alice Onyura, and Jessica Alderman. 2015. "Agency-Based Empowerment Training Enhances Sales Capacity of Female Energy Entrepreneurs in Kenya." *Journal of Health Communication* 20: 67–75. <https://doi.org/10.1080/10810730.2014.1002959>.
- SNV. n.d. "New Skills, New Opportunities Empowering Women as Agents of Change--Vietnam: New Roles for Women in the Biogas Supply Chain." <http://www.snv.org/public/cms/sites/default/files/explore/download/harnessing-climate-change-initiatives-to-benefit-women-adb-reta7914.pdf>.
- Tuntivate, Voravate. 2017. "Review of Gender-Specific Impacts and Opportunities on Efficient, Clean Cooking and Heating Projects Financed by the World Bank." Unpublished draft, April 27.
- UNDP (United Nations Development Programme). 2011. *Towards an 'Energy Plus' Approach for the Poor: A Review of Good Practices and Lessons Learned from Asia and the Pacific*. Bangkok: United Nations Development Programme, Asia-Pacific Regional Centre.
- UNICEF (United Nations International Children's Emergency Fund). 2020. "Gender and Education," February. <https://data.unicef.org/topic/gender/gender-disparities-in-education/>.
- Uteng, Tanu Priya. 2011. "Gendered Bargains of Daily Mobility: Citing Cases from Both Urban and Rural Settings." Background Paper to the 2012 World Development Report. <https://openknowledge.worldbank.org/bitstream/handle/10986/9111/WDR2012-0010.pdf?sequence=1&isAllowed=y>.
- Wilson, D.L., M. Monga, A. Saksena, A. Kumar, and A. Gadgil. 2018. "Effects of USB Port Access on Advanced Cookstove Adoption." *Development Engineering* 3: 209–17.
- World Bank. 2015. *Stoves, Fuels, and Cooking Practices on Sumba Island, Indonesia: Findings and Recommendations of Qualitative Field Research*. East Asia and Pacific (EAP) Gender Facility and Clean Stove Initiative (CSI). Washington, DC: World Bank.
- World Bank. 2018. *Incentivizing a Sustainable Clean Cooking Market: Lessons from a Results-Based Financing Pilot in Indonesia*. Washington, DC: World Bank. <https://openknowledge.worldbank.org/bitstream/handle/10986/30181/128162-WP-P144213-PUBLIC-WBIndonesiaRBFWEB.pdf?sequence=1&isAllowed=y>.



Digital finance helps poor families in remote areas of Sub-Saharan Africa to access new clean-cooking technologies. This mother holds her daughter while using a portable biomass stove that has virtually eliminated pollution-related health risks. © Alison Wright/FINCA International. Used with the permission of Alison Wright/FINCA International. Further permission required for reuse.

# 4 Financing

Most clean cooking programs target lower-income populations, who generally require some form of financial intervention to enable their transition to clean stove-and-fuel technologies. Even where the incomes of beneficiary households are relatively high, supporting measures are likely needed to create and sustain product demand, ensure supply reliability, and overcome high upfront costs. Some of the most common forms of financing include microfinance schemes, informal or semi-formal savings groups, employer loans, and pay-as-you-go (PAYG) (photo 4.1). Impact-driven forms of financing, including results-based financing (RBF) and social impact investing, are quickly gaining ground as ways to pay for the anticipated environmental and social benefits from interventions.

## Supplier-Side Models

### Traditional Microfinance

Microfinance is one mode of supply-side financing that often favors women who are new entrants to the stoves market. Typically, women's stove enterprises operate at a relatively small scale (e.g., village-level retail or artisanal production). Securing a loan from a microfinance institution (MFI) is a relatively straightforward process, though lead times and requirements vary by institution. In Kenya, K-REP Development Agency (KDA) has successfully developed and institutionalized microfinance products that enable low-income customers to acquire a variety of clean and improved cookstoves (e.g., BURN Jiko Koa, EcoZoom Jet and Dura, Wisdom Innovations, and Jiko Smart), as well as solar lanterns and water filters. KDA also assists village banks and agricultural businesses in developing appropriate financial products for the purchase of biogas stoves by tailoring customers' repayment periods to their income source (GACC 2015).

The drawbacks of traditional microfinance may include high interest rates, short loan tenors, and maximum loan amounts that preclude supporting more growth-oriented, small- and medium-sized enterprises (SMEs). Raising the awareness and capacity of MFIs to effectively build loan portfolios in the sector can sometimes require significant effort.

### In-House Options

Integrating in-house financing into project design can reduce women's initial need for equity or securing third-party debt. One popular option is the micro-consignment model (MCM), which has been used in a variety of developing-country contexts to increase women's inclusion in clean cookstove distribution and retailing (e.g., Solar Sisters in Tanzania and Nigeria, Kopernik in Indonesia, Soluciones Comunitarias [SolCom] in Guatemala, Dharma Life in India, and LivelyHoods in Kenya). The MCM finances women's, as well as men's, businesses by providing inventory in lieu of capital, which is repaid as the stoves are sold. This feature can reduce risks if the business suffers a setback (e.g., illness) since companies will usually accept inventory back in lieu of cash payment.

Supplier credit need not be limited to the micro level. Where security is sufficient to transact (in the form of social trust or other bonds), 60-, 90-, or 120-day supplier credit may provide a woman-led medium-sized business selling moderately priced equipment the bulk of liquidity needed to operate.

### Commercial Banks

Unlike social capital and microfinance, commercial banks tend to rely on conventional risk assessment and mitigation tools (e.g., credit ratings, formal lending histories, audited financial statements, and high levels of collateralization), which can dis-

**PHOTO 4.1** Shamba Shape-Up staff and women's savings group discuss payment method for the electric pressure cooker.



© The Mediae Company. Used with permission of The Mediae Company. Further permission required for reuse.

advantage women borrowers (box 4.1). However, the development and increasing availability of psychometric screening tools show promise for closing gender gaps in commercial bank lending. Using its psychometric tool in a pilot program comprising six commercial banks, Harvard University's Entrepreneurial Finance Lab demonstrated that approval rates for male and female applicants were equal, with nearly identical terms applied to the resulting loans. In fact, the percentage of women-owned SMEs receiving bank loans increased by over 70 percent (Klinger, Khwaja, and del Carpio 2013).

#### **Empowerment Mechanisms**

**Women-targeted funding** is designed to support women-led clean cooking and heating enterprises through relevant activities. For example, the Women's Empowerment Fund, established by the Clean Cooking Alliance (CCA), scales effective business models for women energy entrepreneurs by providing working capital, networking, and training.

**Integration of gender targets into standard investment windows and portfolios**—either commercial, grant-based, or blended—is an approach for closing gender employment gaps in the energy sector. In corporate settings, loan origination officers and underwriters can equip themselves with knowledge about the business case for women's increased participation in the sector and practical techniques for identifying and advanc-

ing women-inclusive companies through the pipeline.<sup>1</sup> As part of its eligibility criteria for results-based financing (RBF), the World Bank–hosted Clean Cooking Fund (CCF) requires participating companies to have least 10 percent female employees.

#### **Consumer-Side Models**

Financing for modern energy cooking and heating options is vital, even at the lower end of the market range and increases in importance for products higher up the access tiers of Modern Energy Cooking Services (MECS). For MFIs and development partners, consumer financing can be an attractive proposition because it can leverage an already existing client base to cross-sell into a large, untapped market and build a brand around fulfilling social objectives. The main channels of consumer finance and repayment models are described below.<sup>2</sup>

#### **Microfinance**

The channels of consumer microfinance range from banks, MFIs, and industry cooperatives to community-level savings and credit groups (either existing or project-established). Savings and credit groups go by a variety of names (e.g., rotating savings groups, self-help groups, village savings and loans, and savings and credit cooperatives). Such groups, many of which are community-based and women-led, have flexible loan

**BOX 4.1**

### Financing's role in breaking barriers to women's empowerment

Women entrepreneurs need access to the broad range of available financial products and services to facilitate their participation in larger, capital-intensive stove businesses and more profitable subsectors (e.g., factory manufacturing or large-scale distribution of technologies). However, in many developing countries, women experience limited access to business financing. The causes may stem from social norms, regulatory conditions (e.g., legal capacity and property rights), or variables correlated with being female

(e.g., having fewer initial assets, lower financial literacy, or fewer inroads to professional business and investment networks). Capital provision, combined with business development support, is necessary for launching women-led small- and medium-sized enterprises (SMEs), but it is not enough. Breaking barriers to women's empowerment also requires interventions that can shift mindsets, address psychological barriers, and cultivate leadership qualities.

Sources: Burjorje, El-Zoghbi, and Meyers 2017; Siba 2019.

**BOX 4.2**

### Women's savings groups in Kenya provide flexibility that formal institutions lack

In Kenya, K-Rep Development Agency (KDA) and its subsidiary, K-Rep, support Kiandutu youth ("green" entrepreneurs) in selling a range of cookstoves through savings groups on a commission basis. KDA allows consumers to make a deposit equal to 10 percent of the stove cost and encourages weekly repayments based on the energy cost savings. Younger women, who typically cannot qualify for loans, are especially attracted to this consumer financing model.

Daily household savings, which average KSH 50, are placed in a lockable home "bank" developed by KDA. To motivate others, the bank is regularly opened at group meetings (weekly, bi-weekly, or monthly). Once the loan is paid in full, the realized savings are invested in a project or product of the saver's choosing. KDA sells a variety of improved wood and charcoal cookstoves (in the US\$16–49 price range), as well as biodigesters (costing over US\$1,000).

Source: GACC 2015.

conditions that can be adapted to members' needs and technologies considered for purchase (box 4.2). Such groups have facilitated an increase in women's access to cleaner cooking solutions in such countries as Cambodia, Kenya, Laos, Malawi, and Uganda, among many others. In the Siaya region of western Kenya, some 1,200 cookstove-focused village savings and loans associations (VSLAs) developed by Myclimate resulted in the installation of 36,300 cookstoves.

#### Retail Alternatives

For clientele that purchase high-end cookstoves, larger household heating technologies (e.g., boilers, furnaces, and water heaters), and commercial cooking and heating equipment and retrofits, retail finance provided by commercial banks is appropriate. It is likely that such borrowers are formally employed, have some type of collateral, or can meet relatively high deposit

requirements in their accounts. Loans for modern cooking or heating products would have to be sufficiently large to justify the administrative cost of underwriting; alternatively, a bank customer could use a general credit line for the purchase. More research is needed on whether or to what extent women may be disadvantaged in having access to these forms of finance.

#### In-House Options

In-house financing refers to a company that offers a combination of product and financing services. This convenient, one-stop-shop model can reduce hassles related to onboarding third-party financial service providers, who may be unfamiliar with modern cooking or heating solutions. One initial drawback is that the company may have little prior experience in managing complex cash flows and receivables. In Bangladesh, Grameen Shakti uses in-house financing, building off the

### BOX 4.3

#### Grameen Shakti tailors payment plans to stove technologies

Grameen Shakti—with World Bank funding and in partnership with the Infrastructure Development Company Limited (IDCOL), a government-led financial intermediary—leverages the Grameen Bank’s network of clients, educates them about clean cooking, and offers in-house microfinance for the products it offers, which has enabled the sale of 25,000 biogas plants and 600,000 improved cookstoves. Household cookstoves require a 50 percent down payment with the remainder payable on installation. Commercial cooking products also require a 50 percent down payment, with the other half payable over six months at a flat-rate service charge of 6 percent. For biodigesters, which are more expensive, a 15 percent down payment is required, with the remainder payable over 24 months at a flat-rate service charge of 8 percent. Such payment plans—compared to cash and carry—are especially attractive to women, who in Bangladesh tend to have fewer assets and lower incomes compared to men.

Source: GACC 2015.

**PHOTO 4.2** Faster cooking with LPG has enabled Chikuru Bwinika Gracia to scale her business in Goma, Democratic Republic of Congo.



© Philippe Nyirimihigo/Bboxx Capital RDC. Used with the permission of Philippe Nyirimihigo/Bboxx Capital RDC. Further permission required for reuse.

know-how, track record, and expertise of its sister organization, Grameen Bank (box 4.3). In-house financing is also used by many pay-as-you-go (PAYG) companies that are active in the sector, including KopaGas in Tanzania (utilizing LPG smart meters) and KOKO Networks in Kenya (utilizing ethanol smart canisters). *Bidhaa Sasa* extends credit directly to its rural customers in Kenya, but uses a group methodology similar to that of an MFI, making it possible to reach its predominantly female customers who otherwise would not qualify for traditional microloans (ICRW n.d.).

#### Repayment Modes

In any consumer-financing context, it is important to consider whether the household member who decides to purchase the modern cooking or heating product has access to the financial service (e.g., an account and line of credit), has funds to repay the obligation within the specified period, and will undertake the physical task of repayment (photo 4.2). Models that closely mimic consumer cash flow and reduce transaction costs are encouraged and can make financing more accessible to both

women and men. For example, the maturity dates of microfinance loans that bundle stove products with agricultural inputs could vary by sex of the borrower since the harvesting of male- and female-dominated crops can differ by season.

Mobile payment services have significantly reduced transaction costs for consumers who purchase cooking and heating technologies on credit. Mobile payment models can also be used to address women’s constraints (e.g., time poverty or limited mobility); however, male-female differences in ownership of the devices and accounts should be noted. Mobile payment can be used to match fuel-expenditure patterns with household income receipts. Many PAYG models allow customers to make very small, near-daily fuel purchases. In Tanzania, KopaGas uses a mobile-enabled smart meter attached to the gas regulator to allow customers to smooth their fuel purchases over time. They use mobile money to pay only for the gas they need rather than the full upfront cost of a cylinder refill. PAYG financing could come from the technology provider (on-balance sheet) or a third party (off-balance sheet).

## Impact-Driven Models

This section highlights some impact-driven models that have been applied in the clean cooking sector. If creatively designed, they can contribute to bridging the gender gaps in access to finance.

### Results-Based Financing

Under a results-based financing (RBF) modality, funds are disbursed by an investor or donor to a recipient on achievement of a pre-agreed set of results, subject to independent verification. In the context of clean cooking programs, RBF usually entails contractual agreements with private-sector companies to manufacture and deliver cookstoves to a pre-agreed target population. Once the stoves have been sold to end users and the transaction has been verified through phone calls and physical inspections by an independent verification team, the payment is transferred to the company. The World Bank-supported East Asia Clean Stove Initiative (CSI) in Indonesia featured a two-step, subsidy delivery process for private-sector players, utilizing a designated independent verification team. The first subsidy was delivered after verification of the consumer's purchase of the qualified stove and the second after verification of its actual use (ASTAE 2013).

The World Bank has also tested opportunities for applying the RBF instrument at the impact level. Under the Lao PDR CSI, studies applied RBF to (i) averted disability-adjusted life years (DALYs) from cleaner household air resulting from the cook-stove intervention (Dave and Balasundaram 2016) and (ii) emissions reduction, whereby the private-sector investor supplied the capital used to purchase stoves and, through an Emissions Reduction Purchase Agreement (ERPA) with the government, recouped its investment through the sale of carbon credits.

Currently, the World Bank's Energy Sector Management Assistance Program (ESMAP) is exploring whether impact-targeted funds could be deployed to pay for the verified impact-level results from clean cooking interventions for health, climate, and gender (ESMAP 2020; Tuntivate 2017). Such payments would be an innovative way to (i) attract funds that target these public-good benefits; (ii) develop the clean cooking market by catalyzing private-sector investment, innovation, and risk-taking; and (iii) over time, mainstream approaches that quantify the benefits of clean cooking into national policies and budgetary allocations.

### Social Impact Investing

Increasingly, social impact investing is gaining ground as a way for corporations, foundations, or individuals to invest in the public goods generated by clean cooking and heating interventions (e.g., gender equality, better health, or poverty reduc-

tion). This financing modality places more emphasis on the anticipated social outcomes of the intervention rather than its financial returns, which may be modest or even negative. Common forms of social impact investing include equity or debt financing (at preferential, submarket rates) for producers or suppliers, based on the expected social benefits for end-user consumers.

### Notes

1. Bloomberg and Morgan Stanley have developed quantitative frameworks for assessing companies' gender diversity; based on the results of their empirical investigations, gender diversity is incorporated into their respective product offerings and investment philosophies.
2. Microfinance, retail finance, and in-house financing are the three primary channels through which consumers interact to make purchases, but much more can occur behind the scenes. This includes the issuance of results-based payments or incentives that provide either a capital or interest rate subsidy that eventually reaches the consumer, credit guarantees to reduce lenders' risk premiums, refinance schemes that transfer debt (and risk) to a third party and allow the primary lender to exit and deploy its capital anew, or receivables assignment (in the case of PAYG).

### References

- ASTAE (Asia Sustainable and Alternative Energy Program). 2013. *Indonesia: Toward Universal Access to Clean Cooking*. East Asia and Pacific Clean Stove Initiative Series. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/105441468044144806/pdf/792790ESWOP1290ox0377371B00PUBLIC00.pdf>.
- Burjorjee, D., M. El-Zoghbi, and L. Meyers. 2017. *Social Norms Change for Women's Financial Inclusion*. Washington, DC: Consultative Group to Assist the Poor (CGAP).
- Dave, Rutu, and Rema Balasundaram. 2016. "The Lao Cookstove Experience: Redefining Health through Cleaner Energy Solutions." *Live Wire* 2016/63. World Bank, Washington, DC. <https://openknowledge.worldbank.org/bitstream/handle/10986/24256/TheLaoCookstOner0energy0solutions.pdf?sequence=5&isAllowed=y>.
- ESMAP (Energy Sector Management Assistance Program). 2020. *Quantifying and Measuring Climate, Health, and Gender Co-Benefits from Clean Cooking Interventions: Methodologies Review*. Washington, DC: World Bank.
- GACC (Global Alliance for Clean Cookstoves). 2015. "Consumer Finance Models for Clean Cookstoves: Global Mapping." <https://www.clean-cookingalliance.org/binary-data/RESOURCE/file/000/000/421-1.pdf>
- ICRW (International Center for Research on Women). n.d. "Gender-Smart Investing: Off-Grid Energy Case Study, Bidhaa Sasa." [https://www.icrw.org/wp-content/uploads/2018/12/ICRW\\_Bidhaa-Sasa\\_CaseStudy.pdf](https://www.icrw.org/wp-content/uploads/2018/12/ICRW_Bidhaa-Sasa_CaseStudy.pdf).
- Klinger, B., A. I. Khwaja, and C. del Carpio. 2013. "Enterprising Psychometrics and Poverty Reduction." Entrepreneurial Finance Lab. Cambridge, MA: Harvard University. <https://epod.cid.harvard.edu/sites/default/files/2018-04/eflpaper2013.pdf>.
- Siba, E. 2019. "Empowering Women Entrepreneurs in Developing Countries: Why Current Programs Fall Short." Africa Growth Initiative at Brookings Policy Brief, February. Washington, DC: Brookings Institution. <https://www.brookings.edu/wp-content/uploads/2019/02/Empowering-women-entrepreneurs-in-developing-countries-190215.pdf>.
- Tuntivate, Voravate. 2017. "Review of Gender-Specific Impacts and Opportunities on Efficient, Clean Cooking and Heating Projects Financed by the World Bank." Unpublished draft, April 27.



Julienne Murebwayire, who works as a maid in Rwanda, has been cooking for most of her life—first using firewood and later charcoal, the most difficult part of which was starting the fire. Nowadays, she appreciates the fast-cooking and smokeless features of the wood-pellet cookstove purchased by her employer in 2014, and no longer uses traditional fuels. © Vincent Tremeau/Ci-Dev, World Bank. Further permission required for reuse.

# 5

# Enabling Policies and Market Support

Apart from intervening directly in value-chain transactions through providing capital to entrepreneurs or subsidizing products, clean cooking and heating initiatives can foster the healthy functioning of market ecosystems by defining and enforcing clear regulatory regimes, enabling groups to lobby their governments, supplying actors with market information, and raising public awareness. These activities can also take gender nuances into consideration to maximize their impact and the fairness with which they effect change.

## Policies, Regulations, and Standards Development

Clean stoves markets are embedded in complex sociopolitical contexts. Decisions in these spheres can have gender implications that reverberate throughout countries. Women and men alike are impacted by the prices they pay for stove fuels and technologies, their quality and robustness, and the level of prioritization accorded the sector by the national government. As advocates for change, women have a role to play in lobbying their government. The subsections below highlight questions one should consider when dealing with relevant policy and regulatory issues.

### Policy-Related Questions

Historically, energy policies have tended to favor the electricity and petroleum sectors with little attention paid to cooking and heating, especially biomass-based cooking. The evolution of international norms and adoption of the Sustainable Development Goals (SDGs) have helped to address this imbalance somewhat, although cooking remains a lower priority. The key question is whether the elevation of clean cooking and heating

*issues in national energy policies, strategy papers, and master plans reflect the will and priorities of both men and women, as well as the importance of cooking and heating in total final energy consumption.*

National-level policy language helps to organize the activities of government institutions and funding partners. Reference to gender-related clean cooking and heating issues in official policy documents can help unlock financing for relevant efforts. One should ask the following: *Does the policy use the terms “gender,” “women and men,” or other equivalent language? Does it recognize women as both beneficiaries and agents of change? Does it point out specific gender gaps and propose linked actions to address them? Does it acknowledge the need for gender disaggregated data and provide relevant indicators on closing gender gaps?*

### Regulatory Questions

Regulation, sometimes enacted by legislative bodies but often exercised by statutory authorities, directly impacts the functioning of markets by defining the rules of participation and penalties for not following them. Examples of how regulation impacts the clean cooking and heating sectors include tariff-setting for district heating companies, restrictions on exploiting forests for wood and charcoal production, import tariffs on stove equipment, and LPG fuel subsidies, among others.

Studies assessing a proposed or existing regulation should document *whether and how the regulation poses gender-unequal burdens or benefits for the relevant populations.<sup>1</sup>* Key gender-balanced questions include the following: *Are both women and men substantially involved in the design and creation of the regulation, including during public commenting phases? Are the stakeholder consultations and public com-*

## BOX 5.1

### RISE to benchmark progress in closing gender gaps in clean cooking

Policies and regulations are critical for countries seeking to attract new investment and grow toward a sustainable energy sector in line with Sustainable Development Goal 7 (SDG 7). ESMAP's Regulatory Indicators for Sustainable Energy (RISE) is a tool that policy makers can use to benchmark their sector policy and regulatory framework against

those of regional and global peers. RISE utilizes more than 30 indicators and covers 138 countries (98 percent of the world's population). The 2020 edition of the RISE report includes a full pillar on clean cooking with gender-specific indicators, making it possible to benchmark policy progress on closing gender gaps.

Source: ESMAP 2020a.

ments documented in a way that captures the sex of each contributor? Is input from men and women incorporated in equitable measure into the final rollout? (box 5.1).

#### Standards Development

Clean cooking and heating technologies have required the development of objective and quantifiable performance and design criteria. This was accomplished in 2018 when the first ISO standards on clean cookstoves and clean cooking solutions were published. Implementation of the standards would entail incorporating them into regulations (e.g., prohibiting inferior products from being sold in the market) or labeling schemes as a way of informing consumers about product quality. The following questions would be relevant in trying to determine if the standards are contributing to closing the gender gaps or widening them: *Do the standards favor one gender of producer? Is there an established link between the sex of the producer/supplier and stoves that fail to meet the performance thresholds? If so, does the existence of new standards diminish those producers'/suppliers' businesses? Are support measures then put in place to aid them in improving the quality of their product? Is there balanced representation in the standards-setting committee?*

One should also inquire whether the facility used to test the clean stove technology is equally available to male and female producers in terms of both cost and geography. In addition, one needs to ask whether the bureaucratic process of obtaining a standards certification is designed with both women and men in mind.

#### Research, Advocacy, and Market Intelligence

The engines of research, advocacy, and market intelligence have helped to advance gender equality in the clean cooking and heating space for development- and private-sector players alike, yet much work remains. Public-purpose knowledge is needed to deepen the understanding of sex-specific impacts (e.g., on time savings and intra-household savings and expenditures), provide men and women with actionable business insights, and channel new knowledge into public-policy spheres.

Through ESMAP, the World Bank has become a global leader in generating knowledge support for the sector. ESMAP's work, including the Global Platform for Knowledge, Innovation, and Policy Coordination under the Clean Cooking Fund (CCF), is aligned with the World Bank Group's Gender Strategy 2016–23 (box O.1). Organizations like the Clean Cooking Alliance (CCA) are also working across research, advocacy, and market intelligence. The CCA funds, consolidates, and publishes research from its partners on performance, user adoption, impacts, and market trends around the globe. It also supports awareness campaigns targeting consumers, as well as advocacy within policy-making spheres. In addition, it has a clearly articulated [gender strategy](#), which is currently being updated.

#### Research and Advocacy

Historical advances in clean cooking and heating technology appropriate to developing country contexts have been spurred, in part, by research on the adverse impacts of traditional cooking and heating on health (particularly women's pollution exposure) and the environment (deforestation and black carbon). For over 40 years, groups like [Aprovecho](#) Research Centre and Berkeley Air Monitoring Group have applied a strict research mindset for improving on stove designs. Over time,

funding of such scientific research has led to better quantification of the levels of technical performance that correlate with the desired health and environmental benefits. Global practitioners have long sought to embed technical performance within real-world, user-centered contexts, as opposed to controlled laboratory environments; but the sheer variety of technology options and cultural practices means that much more needs to be learned and documented. In the cooking context, user-centered studies require working in close conjunction with cooks, who are predominantly female.

Publicly funded research and advocacy have also been important for establishing the business case for women's

increased participation in the sector, which can incentivize development agencies and the private sector to seek out more inclusive business and implementation models. Two examples illustrate how women leaders can be strong advocates for clean cooking (boxes 5.2 and 5.3).

#### **Market Intelligence**

Without market intelligence, it is difficult to establish a successful business. Market mapping—studying various market conditions to identify and understand trends in products, consumer preferences, and financing options—is vital for identifying the opportunities and challenges a business might encoun-

#### **BOX 5.2**

### **Ghana's Second Lady uses her platform to promote adoption of clean cooking solutions**

Women in leadership positions are emerging as effective advocates for clean cooking. Among them is Ghana's Second Lady, Her Excellency Mrs. Hadjia Samira Bawumia. As an ambassador for the Clean Cooking Alliance (CCA), she has used her political platform to raise the profile of clean cooking in Ghana, as well as globally. As a result of

her efforts, Ghana is among the few African countries that have prioritized clean cooking in their policies. Recently, Her Excellency was honored by Sustainable Energy for All (SEforALL) as one of seven global climate heroes—Seven for 7—working in energy and health.

Source: CCA 2019.

#### **BOX 5.3**

### **Testing hypotheses about female entrepreneurs' effectiveness**

A recent study commissioned by the Clean Cooking Alliance (CCA) examined the impact of engaging women as entrepreneurs in the clean-cooking value chain on sales and adoption of improved cookstoves (ICS). The study was a collaborative effort of the Center for Global Clean Air at the Johns Hopkins Bloomberg School of Public Health, ESVAK Kenya, and Envirofit International.

The study's threefold objectives were to determine (i) if female entrepreneurs are as effective as male entrepreneurs in selling ICS in rural and urban sites in Kenya; (ii) if an agency-based empowerment training improves the effectiveness of ICS entrepreneurs when compared with standard entrepreneurial training; and (iii) if reported ICS usage and satisfaction differ by gender of the sales agent.

Using a randomized trial that assigned men and women to separate training groups and monitored their sales and customer follow-up for eight months, the researchers found that women outsold men by a three-to-one margin. The findings also showed that individuals who received the empowerment training were more likely to persist in their businesses and were three times more likely to be higher sellers. In addition, customers who purchased their ICS from women entrepreneurs expressed greater satisfaction with their purchase,<sup>a</sup> were more likely to use the stove consistently, and were generally better able to explain how the stove should be used.

Source: Shankar, Onyura, and Alderman 2015.

a. Women reported the benefits of their ICS, compared to their traditional cookstoves, as being "very easy" (63 percent versus 45 percent), "very safe" (55 percent versus 26 percent), and "much better" (74 percent versus 62 percent).

ter. However, for many owners of small- and medium-sized enterprises (SMEs), conducting such studies is often poorly understood or too expensive. Women entrepreneurs may face specific barriers to obtaining accurate market information. Owing to lower literacy levels or poor access, they may be unaware that such services exist. Also, SME experts may not target women's enterprises because of their size and sector. According to a report of the Organisation for Economic Co-operation and Development (OECD n.d.), women are less likely to seek counseling and expert advice on starting up and developing their businesses, one of the many barriers associated with the higher failure rate of women's businesses.

However, commissioned consulting studies can benefit women-led SMEs through information shared at university and graduate-student seminars and workshops; industry-sponsored workshops with key stakeholders (e.g., suppliers, financiers, and researchers); and study tours on clean-stove technology applications in dynamic markets. These types of activities usually require financial support and coordination from governments or development partners.

Owing to their financial and social interests, some cook-stove manufacturers and wholesalers have long shared market intelligence and opportunities with women engaged in their sales networks. Importantly, sales agents' feedback has

informed these upstream actors about preferences and trends in the last-mile market segment. Insights on how women-led businesses operate and succeed are also valuable to upstream actors considering integrating more women into their businesses (e.g., salesforce) (box 5.4).

### Awareness Raising to Stimulate Behavior Change and Uptake

Cooking or space heating with polluting traditional stove-and-fuel combinations is routinized behavior for about half of the global population (ESMAP 2020b). Developing sustainable markets for modern energy solutions requires that women and men change their mindsets about adoption and use. Reluctance toward making the switch to clean cooking and heating technologies can result from low consumer awareness or misperception about product benefits, long ingrained traditions and habits, and suspicion of new technologies. In cases where potential consumers are aware of the benefits, they might not know where to buy the new technologies or remain unconvinced that the problems associated with traditional cooking and heating could be solved by the available products.

#### BOX 5.4

#### Actionable business insights from working with female micro-entrepreneurs

Kopernik, a company specializing in last-mile technology distribution, has rigorous data collection and analysis protocols in place for the programs it implements. One such program, Wonder Women, empowers individuals in marketing water filtration, solar PV, and cooking technologies in last-mile communities of Indonesia. Survey results from Wonder Women participants found that women who remained active in the program, compared to those who exited, invested about twice the amount of time in business activities but realized nearly five times the sales. The most-cited reason for leaving the program was lack of time. Most recruits had pre-existing businesses, so the side business was given up when returns did not equal the opportunity cost of the time invested. An extra two hours per week was the average threshold at which returns became significant enough that women were encouraged to stay.

In A/B testing of sales strategies, the one that provided female agents incentives (commissions, plus a chance

to win a motorbike) saw a US\$5.8 return on each US\$1 invested, compared to US\$2.6 return for each US\$1 invested in newspaper advertising. Financing was important for consumers across all product price points; one-third paid in installments for products in the US\$7–15 range, rising to two-thirds for products costing more than US\$60.

Interviews with 66 Wonder Women entrepreneurs found that spousal involvement was correlated with sales success, but only up to a point, after which performance dipped again. Among the 140 entrepreneurs surveyed, representation in the high-performing agent category was greater among those with work experience in social services (e.g., as teachers, public servants, and employees of nongovernmental organizations [NGOs]), versus those with prior business experience, possibly because of their wider social networks. Women with access to motorbikes realized twice the number of sales as those without such access.

Source: Kopernik 2021.

**PHOTO 5.1** Consumer's Choice sales team leaders and public officials discuss Tanzania's new ethanol stove-and-fuel program.



© Mohammed Kadhi/Consumer's Choice, Ltd Used with the permission of Mohammed Kadhi/Consumer's Choice, Ltd. Further permission required for reuse.

Publicly funded awareness-raising and promotion campaigns, in combination with other tools, can be an effective way to promote market-based development by laying the foundation for behavioral change in household cooking and heating (photo 5.1). Public awareness-raising and promotion campaigns are subject to the same considerations as marketing and retailing (chapter 3). A study funded by the UK Department for International Development (DFID) (since renamed the Foreign, Commonwealth & Development Office) on behavior-change communication campaigns to promote modern stove purchase and use found that gender, as well as media, influence product preferences (Evans et al. 2018). To achieve the desired demographic targeting, care must be taken in deciding (i) which channels are most likely to reach women and men (e.g., television or radio; social media; public events, talks, presentations, or demonstrations; printed materials [posters and leaflets]; and word-of-mouth); (ii) which messages are most likely to persuade them; (iii) who will most likely be making the purchasing decision; and (iv) who will most likely be the primary technology adopter.

### Training, Capacity Strengthening, and Business Development

Beyond start-up cash and a basic inventory, training, capacity strengthening, and business development are important

for unlocking sources of private capital and ensuring entrepreneurs have the required soft skills for continued growth. Lenders and investors will not participate in transactions until assured that the entrepreneur has a reasonable chance of success. Women's disadvantage in access to finance due to lower initial asset levels could be offset by having received high-quality capacity building and business development. In Côte d'Ivoire, for example, the Women Entrepreneurs Finance Initiative (We-Fi), supported by the World Bank and the International Finance Corporation (IFC), trained women SMEs in preparing and maintaining financial statements and other soft skills to better position them for accessing institutional financing (World Bank and IFC 2018).

Most contexts feature male-female differences in business readiness, whether judged by education, previous entrepreneurial experience, or personal beliefs and confidence in one's ability to succeed. In education, for example, men may be overrepresented in technical studies, or women may be overrepresented in business administration programs. Before launching any support program, such potential differences must be considered in the context of the local setting. While training women on the various aspects of the clean cooking or heating supply chain (technical, business, and financial) can increase their chances of success, the specific nature of that training matters. Capacity-building and training initiatives are more successful overall when they account for women's starting psychological and social constraints and address those in combination with providing general entrepreneurship support (Siba 2019).

### Agency-Based Empowerment/Leadership Training

A powerful tool for boosting clean stoves sales is agency-based empowerment. Adapted from the health sector by ENERGIA and its partners, this training methodology enhances an individual's cognitive capacity to focus on and realize his or her goals and leadership skills (Smith and Shankar 2015). In Bolivia, agency-based empowerment and leadership training helped women find new ways of selling and promoting stoves, thereby enhancing demand. In Kenya, training in agency-based empowerment and leadership was shown to boost stove sales, especially among women entrepreneurs (box 5.3).

## Mentorship

Mentorship programs offer another avenue through which women can gain from skills transfer and networks to advance their business and career opportunities in the clean cooking sector. Examples include the CCA's Women in Clean Cooking Mentorship Program, Sustainable Energy for All (SEforALL), and the Global Women's Network for the Energy Transition (GWNET). Such programs match mentees with experienced mentors who support them in their professional career growth while offering networking and knowledge-transfer opportunities.

## Business Development Services

The IFC defines business development services as non-financial products and services offered to entrepreneurs at various stages of their business needs, primarily aimed at skills transfer or business advice (IFC 2006). Business development services can include marketing support (advertising, market linkages, and branding), consulting services, support for improved access to business information or technology, infrastructure support (warehousing or transport of goods), advocacy, financial matchmaking, support for networking and increased business visibility, and mentoring.

## Identification of Anchor Customers

Anchor customers are critical to business viability as they provide substantial, consistent orders that advance the business

toward commercialization and establishing brand credibility. In stove retailing, anchor customers are often professional workers clustered in specific locations (e.g., estates and mines, schools, and health clinics) with steady incomes but poor access to clean cooking and heating technologies. Clustering lowers the cost of reaching such customers, while their employment relationship make the new technologies more affordable and supports financing schemes.

Because of historical gender gaps in business knowledge, women entrepreneurs are likely to lack (i) resources with which to identify anchor customers; (ii) networks and capacity to negotiate terms with them; and in some cases (iii) capacity to deliver at the required scale and on schedule. Supporting women in identifying and negotiating with anchor customers is an emerging best practice (box 5.5).

## Technical Skills Training

Technical skills training in clean cooking and heating solutions theoretically runs the gamut from mud stove construction, ceramics, and artisanal metalworking to fuel processing (e.g., ethanol and briquettes), factory-line set-up and operations, and boiler installation and repair. Clean cooking programs commonly provide women-targeted training, especially when the technology being promoted is locally produced or installed.

Technical training initiatives may be "gender-aware," meaning that they help women's entry into jobs traditionally con-

### BOX 5.5

#### Combining agency-based empowerment, business development services, and anchor-customer identification in Kenya

Women in Energy Enterprises in Kenya (WEEK)—a project implemented by Practical Action in Eastern Africa and Sustainable Community Development Services (SCODE), a local Kenyan nongovernmental organization (NGO)—provided a package of business development services to support women's engagement in three renewable energy markets: (i) improved cookstoves (ICS), (ii) solar products, and (iii) biomass briquettes. The project trained more than 1,900 entrepreneurs, a portion of whom went on to sell over 100,000 stoves within the three-year project period. The women entrepreneurs were provided training, technology support, business mentoring, and financing link-

ages. Also, their satisfaction with the type and level of services received was reported on and monitored.

WEEK negotiated for Chinga Tea Factory, which employs thousands of laborers, to become an anchor customer. Through this factory, the women sold thousands of cookstoves, with one woman selling as many as 3,500 stoves to fellow tea farmers. In addition, WEEK engaged with Savings and Credit Cooperatives (SACCOs). In addition to helping finance the women trained by SCODE, SACCOs acted as a marketing point for delivery of ICS and biodigesters to hundreds of members, with significant cost savings.

Sources: ENERGIA 2016; Hart and Smith 2013; Ruggles 2017.

## BOX 5.6

### The value of training women in technical stove skills

Appropriate Energy Saving Technologies (AEST) Ltd., a company selling charcoal briquettes and cookstoves in Uganda, trained all of the women and men on its production teams on each piece of equipment. When the men went on strike to protest the women receiving equal wages, the women were able to continue operating the machines in the men's absence, and the strike was ultimately ineffective. The founder and CEO did not want men to be the "sole holders of specialized knowledge" because of the risks this posed to management.

Source: ICRW n.d.

sidered acceptable for females (e.g., ceramics) or "gender-transformative," helping women to enter traditionally male occupations (e.g., metalworking) (box 5.6). A vast array of technical skills could be in demand, but the key is making sure trainees are well-linked to employment or entrepreneurship opportunities on program completion.

### Note

1. Kitson et al. (2016) provides a useful review of the gendered impacts of fossil-fuel subsidy reform.

### References

- CCA (Clean Cooking Alliance). 2019. "Second Lady of Ghana and Clean Cooking Champion Samira Bawumia Announced as SEforAll #SevenFor7 Honoree." Alliance News, September 19. <https://www.cleancookingalliance.org/about/news/09-19-2019-second-lady-of-ghana-and-clean-cooking-champion-samira-bawumia-announced-as-se-forall-sevenfor7-honoree.html>.
- ENERGIA. 2016. "Practical Action: Women in Energy Enterprises in Kenya." February 16. <https://www.energia.org/practical-action-women-in-energy-enterprises-in-kenya/>.
- ESMAP (Energy Sector Management Assistance Program). 2020a. *Regulatory Indicators for Sustainable Energy (RISE): Sustaining the Momentum*. Washington, DC: World Bank.
- ESMAP (Energy Sector Management Assistance Program). 2020b. *The State of Access to Modern Energy Cooking Services*. Washington, DC: World Bank Group.
- Evans, William Douglas, Michael Johnson, Kirstie Jagoe, Dana Charron, Bonnie N. Young, A. S. M. Mashiru Rahman, Daniel Omolloh, and Julie Ipe. 2018. "Evaluation of Behavior Change Communication Campaigns to Promote Modern Cookstove Purchase and Use in Lower Middle Income Countries." *International Journal of Environmental Research and Public Health* 15 (1): 11. <http://dx.doi.org/10.3390/ijerph15010011>.
- Hart, Corinne, and Genevieve Smith. 2013. "Scaling Adoption of Clean Cooking Solutions through Women's Empowerment." Resources, September 25. <http://cleancookstoves.org/resources/223.html>.
- ICRW (International Center for Research on Women). n.d. "Gender-Smart Investing: Off-Grid Energy Case Study, Appropriate Energy Saving Technologies (AEST)." [https://www.icrw.org/wp-content/uploads/2018/12/ICRW\\_AEST\\_CaseStudy.pdf](https://www.icrw.org/wp-content/uploads/2018/12/ICRW_AEST_CaseStudy.pdf).
- IFC (International Finance Corporation). 2006. *Diagnostic Study on Access to Finance for Women Entrepreneurs in South Africa*, 52–77. Washington, DC: International Finance Corporation.
- Kitson, Lucy, Laura Merrill, Christopher Beaton, Shruti Sharma, and Andrew McCarthy. 2016. *Gender and Fossil Fuel Subsidy Reform: Current Status of Research*. Global Subsidies Initiative (GSI) Report. Geneva: International Institute for Sustainable Development (IISD). <https://www.iisd.org/sites/default/files/publications/gender-fossil-fuel-subsidy-reform-current-status-research.pdf>.
- Kopernik. 2021. K-Insights. <https://kopernik.info/en/insights-reports/kin-type=technologydistribution&subtype=wonder%20women>.
- OECD (Organisation for Economic Co-operation and Development). n.d. "Small Businesses, Job Creation and Growth: Facts, Obstacles and Best Practices." Organisation for Economic Co-operation and Development, Paris. <https://www.oecd.org/cfe/smes/2090740.pdf>.
- Ruggles, Melissa. 2017. "NGOs and Tea Factories Team Up with Cooperatives and Women Farmers to Increase Access to Clean Cooking in Kenya." Sustainable Energy for All (SEforALL) (blog), October 26. <https://www.seforall.org/content/ngos-factories-cooperatives-women-farmers-increase-access-clean-cooking>.
- Shankar, Anita, Mary Alice Onyura, and Jessica Alderman. 2015. "Agency-Based Empowerment Training Enhances Sales Capacity of Female Energy Entrepreneurs in Kenya." *Journal of Health Communication* 20: 67–75. <https://doi.org/10.1080/10810730.2014.1002959>.
- Siba, E. 2019. "Empowering Women Entrepreneurs in Developing Countries: Why Current Programs Fall Short." Africa Growth Initiative at Brookings Policy Brief, February. Washington, DC: Brookings Institution. <https://www.brookings.edu/wp-content/uploads/2019/02/Empowering-women-entrepreneurs-in-developing-countries-190215.pdf>.
- Smith, Genevieve, and Anita Shankar. 2015. *Empowered Entrepreneur Training Handbook*. Washington, DC: Global Alliance for Clean Cookstoves. <http://cleancookstoves.org/resources/342.html>.
- World Bank and IFC (International Finance Corporation). 2018. "Women Entrepreneurs Finance Initiative (We-Fi): Creating Finance and Markets for All." <https://we-fi.org/wp-content/uploads/2019/01/Joint-World-Bank-Group-We-Fi-Public-Proposal-1.pdf>



Elizabeth Eunice cooks dinner for her family in Kisumu West, Kenya with her new rocket stove. It uses less firewood than her previous stove, allowing her to have more time to care for her baby and other activities. © Peter Kapuscinski/World Bank. Further permission required for reuse.

PART  
**3**

## How to Design Gender- Responsive Projects

- 6. Practical Guidance for Task Teams
- 7. Closing the Gaps



Digital finance is helping Uganda's youth to access next-generation cooking technology to build a brighter future. This portable biomass stove cuts fuelwood use by half, eliminates nearly all toxic emissions, and leverages thermoelectrics to charge mobile devices. © Alison Wright/FINCA International. Used with the permission of Alison Wright/FINCA International. Further permission required for reuse.

# 6

# Practical Guidance for Task Teams

Gender considerations can be integrated into clean cooking and heating programs through two key pathways: (i) sustained adoption and use of the intervention stove technologies and fuels and (ii) women's engagement across the value chain. The former pathway contributes to enhancing women's endowments in health and economic opportunities, while the latter contributes to increasing women's economic opportunities and, to some extent, women's agency.

To assess the gender-differentiated impacts of projects and potential opportunities to bridge gaps, task teams can consider interventions for the following phases: (i) analysis; (ii) stakeholder consultations; (iii) safeguard screening; (iv) project design; (v) monitoring, verification, and evaluation (MV&E); and (vi) budget issues and human resources. For each phase, potential entry points for closing gaps between men and women can be identified. One should note that entry-point activities are not executed in a linear fashion; rather, they run concurrently with and inform one another. This chapter is particularly useful for those seeking to measure progress via the Gender Tag (box O.1).

## Analysis

Analysis lays the foundation for identifying relevant gender gaps in women's and men's roles at project identification and conceptualization and exploring how to narrow them. Among other things, analysis involves examining the relations between women and men; their respective levels of access to and control of resources; their division of labor and daily/seasonal activity routines; their involvement in socioeconomic and political activities; and sex-specific behaviors, norms, and values. Various outcomes from initial analyses can help task teams decide what direction the project should take. These include

how to conduct stakeholder consultations and who to consult; who the main beneficiaries are and how best to optimize their benefits; the existing rights, participation, or representation opportunities for women; and the project design or technology that would best narrow gender gaps.

In addition to background information, analysis should include the issues covered in the previous chapters of this report (box 6.1). Overarching themes are how to address gender disparities and how a deeper understanding of gender gaps can lead to a more vibrant supply and wider adoption of the modern cooking or heating technology.

A review of analytical studies in other sectors can offer insights on other relevant gender gaps that clean cooking and heating programs can address. Various organizations, including the International Monetary Fund (IMF), generate analyses on a range of gender issues (box 6.2).

To effectively conduct analysis, primary and secondary data (both qualitative and quantitative) must be sex-disaggregated. To identify the gaps that need to be addressed, the data is processed and analyzed, and the identified gaps are fully integrated into the project design documents (for World Bank projects this includes the project concept note [PCN] and project appraisal document [PAD]). The factors discussed in Parts 1 and 2 of this report—on consumers, supply-chain actors, and the enabling environment—could serve as a starting point for listing issues to be investigated during the process of conducting the analysis. In addition, maintaining an open mind can help in identifying novel or unanticipated issues that may arise.

Gender specialists should support the task team members responsible for project identification, design, and preparation, preferably from an early stage. Analysis is an ongoing responsibility that must be tightly inscribed within the other phases of project preparation (stakeholder consultations,

## BOX 6.1

### Checklist for integrating analysis issues into clean cooking and heating projects

#### End-User Level: Women and Men

- ✓ Norms and roles concerning appliance purchases, fuel procurement, and utilizing stoves for cooking or heating (including productive uses)
- ✓ Differences in product/service preference and design considerations
- ✓ Differences in awareness about issues related to clean cooking or heating and the availability of specific technologies
- ✓ Differences in anticipated costs and benefits of switching to modern cooking or heating solutions
- ✓ Differences in responses to marketing and sales strategies
- ✓ Differences in responses to strategies aimed at sustaining uptake (e.g., after-sales service and use incentives)

#### Value Chain

- ✓ Differences in current rates of participation by value-chain segment and job type
- ✓ Barriers faced by women and men in becoming more active/successful in the value chain (e.g., access to capital and skills)
- ✓ Degree to which product suppliers, service providers, and financiers are reaching both male and female customers and in the right proportions

#### Enabling Policy and Regulatory Environment

- ✓ Differences in how regulations and policies pertaining to clean cooking and heating affect men and women
- ✓ Degree to which sector-relevant, supporting ecosystems (education, training, finance, market intelligence, and professional and government services) are equally available to men and women and designed with both in mind
- ✓ Differences in women's and men's participation in governance and policy decision-making related to clean cooking and heating

## BOX 6.2

### Analytical work by the IMF highlights key areas for narrowing gender gaps

Since 2015, the International Monetary Fund (IMF) has integrated analysis of gender equality into its regular consultations with member country authorities. More than 40 reports with a specific focus on gender issues have been completed. The types of analyses conducted by the IMF are wide-ranging. Examples include the impacts that wage gaps in women's labor-force participation have had on growth and inclusiveness in India, Morocco, and Rwanda;

the boost in productivity and growth from closing gender gaps in Niger and Pakistan; and the improved competitiveness from women's financial inclusion and economic empowerment in India and Pakistan. Additional examples include the impact of policy measures to reduce gender inequality (e.g., child-care provision in Egypt and cash transfers targeting girls' education in Nigeria) and "gender budgeting" in Morocco and Rwanda.<sup>a</sup>

Source: IMF n.d.

a. According to the European Institute for Gender Equality (EIGE 2021), gender budgeting is a strategy to achieve equality between women and men by focusing on how public resources are collected and spent.

**PHOTO 6.1** In Chongwe, Zambia, this grandmother cooks outdoors during her family's farming activities.



© Jason Mulikita/Renewable Energy and Energy Efficiency Partnership. Used with the permission of Jason Mulikita/Renewable Energy and Energy Efficiency Partnership. Further permission required for reuse.

project design, and MV&E), as together they form a highly interdependent and iterative set of processes. In some cases, analysis focused on women and men may be a core activity of the project (photo 6.1, box 6.3).

### Stakeholder Consultations

At the project identification stage, stakeholder consultations and engagement help in developing well-informed projects that are targeted and coherent, and that can address social, economic, and cultural barriers to adopting modern cooking or heating solutions. Throughout the project cycle, such consultations solicit important insights while driving participation, consensus, and buy-in.

Multilayer consultation—that is, consulting multiple types of stakeholders on a range of issues using a variety of techniques—is considered a best practice (box 6.4). This approach not only captures the views of those affected by the project (e.g., consumers, businesses, financiers, and policy makers). It also allows for capturing the views of individuals (men and

women), groups, and associations with knowledge of similar projects, technologies, and gender issues in the country. These stakeholders are important as they may have macro-level data and information critical to the project design, as well as relevant insights on what does or does not work in the particular project setting.

The starting point for inclusive consultations and engagement is conducting a stakeholder mapping exercise, leveraging gender and clean stoves experts, to identify those who will be consulted. An initial shortlist can be used in a snowballing manner to identify networks of relevant stakeholders, including women and men in target communities, gender experts, organizations working on gender issues, private-sector actors (especially those in energy and finance), government policy makers (including energy ministries and the so-called gender machineries [e.g., gender observatories and ministries]). At this stage, it can be helpful to set targets for the participation of women or other stakeholder groups.

Appropriate methods should be used to connect with the various stakeholders. For example, workshops held in large cities may be suitable for consultations with policy makers, project

**BOX 6.3**

### Gender analysis is not limited to the project design phase

The World Bank Group's East Asia and Pacific Gender Innovation Lab (EAP GIL) plans to conduct a rigorous impact evaluation (IE) under the Lao PDR Clean Stove Initiative (CSI), which will measure the impact of access to modern cooking technology on women's time use, labor market activities, bargaining power, and household consumption patterns.

The IE seeks to answer the following questions:

- How does access to modern cooking technologies impact the domestic burden in the household? How does it affect women's time use?
- To what extent does it reduce the time needed for cooking, collecting fuel, and cleaning utensils?
- In response to a decrease in the domestic labor burden, do women spend additional time on productive activities or change the types of productive activities they engage in?
- Does a shift in the domestic labor burden affect women's time spent on rest or leisure activities or reduce their overall labor burden? Does it promote an improved sense of well-being or life satisfaction?

- Does promotion of modern cooking technologies affect intra-household bargaining?
- How does access to modern cooking technologies change household consumption patterns and well-being?

The IE team will utilize a randomized controlled trial (RCT) at two levels. At the village level, it will randomize the share of eligible households that will receive a stove. This will enable the EAP GIL to explore research questions related to the broader community impacts and measure the program's potential spillover effects. Within each village, the team will identify eligible households according to predetermined eligibility criteria and randomly select those that will receive a subsidized stove for their personal use. The team will also randomly select some ineligible households to include in the data collection in order to capture spillover effects on the community. The data for this IE will be drawn from three household surveys conducted at baseline, midline, and endline.

implementers, and certain private-sector actors. For engaging women and men in the project-affected communities, focus group discussions (FGDs) and field visits with one-to-one and key informant interviews are useful (boxes 6.5 and 6.6).

To ensure meaningful participation in consultations, task teams should consider the following:

- Tailor communication materials about the project or planned consultation activities to both women and men, noting their literacy levels and preferred channels for receiving information (e.g., word-of-mouth, announcement from a trusted organization, radio, or pamphlet).
- Employ both male and female community liaisons, focus group moderators, interviewers, and enumerators to encourage the participation of both men and women and provide individuals the opportunity to speak with someone of either gender if doing so is the norm.

- Choose dates, times, and locations for FGDs or meetings that are convenient, possibly piggy-backing off other events, and avoiding times when women and men have competing obligations.
- Conduct separate female-only consultations in cases where women would be discouraged from speaking in mixed groups or where women's and men's schedules would prevent them from assembling at the same time and place.
- Explore the option of providing childcare at meetings to encourage women's attendance and participation.
- Provide travel stipends to women and economically disadvantaged participants when appropriate so that cost is not a barrier to attendance.
- Establish conventions/practices during meetings to ensure no one group dominates the conversation. This could include using "talking sticks," participatory exercises where everyone submits their input on questions, or turn-taking.

#### BOX 6.4

### Multilayer consultations in Pakistan

The Pakistan Domestic Biogas Programme (2009–13) aimed to facilitate the construction of 14,000 household-level biogas plants across central Punjab to increase rural access to sustainable energy and reduce demand for subsidized fossil fuels. As end users, women were the main program beneficiaries; however, few women in the program area owned biogas plants. For example, a feasibility study in Faisalabad found that only 1 out of 18 biogas plants was woman-owned. Thus, it was decided that a new project should be launched to increase awareness of gender-specific concerns and maximize project benefits. Under the new project, Gender Mainstreaming in the PDBP, three levels of stakeholder consultations were held, supported by gender experts from Winrock International, SNV, and ENERGIA.

First, national-level consultations were held with head-office leadership of the Rural Support Programmes Network (RSPN). These were followed by district-level consultations, after which a gender action plan (GAP)

was presented at a multi-stakeholder workshop, which included representatives of government agencies, non-governmental organizations (NGOs), biogas construction companies, activists, and biogas users. To understand the gender issues affecting biogas users and project implementers, community-level consultations were held through field visits, informal and key informant interviews, and focus group discussions (FGDs).

A final evaluation of the PDBP showed that, as a result of the GAP and consultations, project management, staff, and biogas construction companies had better attitudes about and knowledge of gender issues. The literature on gender developed under the project has been used in successive donor proposals. Before the multi-stakeholder workshop and development of the GAP, user trainings focused on men only. Afterwards, trainings were offered to at least one man and one woman per user household. Also, to address women's needs, a separate space was allocated for married females to come with their babies and nannies.

Source: RSPN 2011.

#### BOX 6.5

### Stakeholder consultations identifying women's needs spur a successful advocacy movement in Sudan

In 2003, following an assessment of living conditions in the Wau Nour neighborhood of Kassala, Sudan, the Intermediate Technology Development Group (now Practical Action) conducted a trial with 30 households promoting their switch from biomass to liquefied petroleum gas (LPG). Subsequently, it started working with the Women's Development Association Networks (WDAN) to scale up biomass-to-LPG switching in Kassala and El Fashir, North Darfur. As the country's first registered Clean Development Mechanism (CDM) project, the Low Smoke Stoves Project is now in its third phase (2018–21).

Sources: Practical Action n.d.

The WDAN successfully lobbied the Greater Nile Petroleum company to provide 5-kg LPG canisters, in addition to the standard 12.5-kg ones. The need among female clientele and nomadic families for smaller canisters, which are cheaper and more portable, was identified through stakeholder consultations. The WDAN played a key role in (i) identifying consumer preferences, (ii) aggregating consumer voices (50,000 members), and (iii) effectively communicating their preferences to relevant stakeholders and advocating for change. Expanding the range of available canister sizes has contributed to the project's success, with nearly 12,000 households now using LPG for cooking.

## BOX 6.6

### Setting and tracking targets for inclusive consultations: The first step in achieving balance

Expanding district heating in Mongolia's capital city is a key objective of the Asian Development Bank's support to the Ulaanbatar Urban Services and Ger Areas Development Investment Programme. The program component aims to reduce air pollution in Ulaanbatar by constructing 21 km of district heating network, 2.4 km of heating service connections, and five heating facilities.

As part of a strategy to reduce gender gaps between women and men, a gender action plan (GAP) was developed. Although the gaps to be addressed were not specified, the GAP included best practices in inclusive consultation by (i) setting a women's participation target of 50 percent in all consultations and (ii) mandating that details of the final project proposal be confirmed by women and men, as well as the elderly, affected households, and persons with disabilities.

Community-level focus group discussions (FGDs), which specifically targeted women and vulnerable persons, included 65 community members of whom 65 percent were female. The needs identified and prioritized by

the women and men were documented and integrated into infrastructure designs. Sex-disaggregated data was collected for all participants in all consultations and is reported on in quarterly and semi-annual project implementation reports; these ensure that gender gaps (and progress in narrowing them) remain relevant and are monitored throughout the life of the project. Between 2015 and April 2017, 95 community consultations were held with 2,652 persons, of whom 56 percent were women. Project design consultations (9 meetings) engaged 242 individuals (117 women and 125 men), 6 percent of whom represented female-headed households.

A summary of design consultations noted that women's contributions focused more on the proposed design of roads and service centers than on technical specifications.<sup>a</sup> It was also noted that both women and men preferred district heating over coal and wood; however, more women than men preferred district heating over natural gas due to safety concerns about stove explosions.

Sources: ADB 2017; EBRD and CIF 2016.

a. This observation is consistent with those in Ukraine and Kazakhstan, where women's participation in district heating meetings related more to payments, reflecting their traditional role in family budgeting.

- Record feedback and inputs by gender of the contributor and follow up to see whose comments were actually addressed or led to some form of concrete action.
- Establish Free, Prior, and Informed Consent (FPIC). Although most often used in conjunction with large infrastructure projects and Indigenous Peoples, several FPIC tenets can be applied to projects focused on clean cooking or heating solutions.<sup>1</sup>
- Conduct local language consultations to reduce ambiguity and enable women and men with lower literacy levels to participate effectively.

### Safeguard Screening

On October 1, 2018, the World Bank operationalized the Environmental and Social Framework (ESF) with a set of 10 Envi-

ronmental and Social Standards (ESS) used to screen projects. Among these, [ESS10](#) offers detailed guidance on stakeholder engagement. Thus, the items discussed in the previous section will play a role in gathering information and insights to inform safeguard screening. In turn, safeguard screening will partially inform monitoring, verification, and evaluation (MV&E) activities. Any domain of significant concern identified during the screening process should lead to the creation of an indicator to capture and track its outcomes.

Owing to the special emphasis placed on safeguard concerns by the World Bank and the contextual nature of those issues, this report does not include specific guidance on safeguards, and only highlights potential areas that may be of relevance to clean cooking and heating programs. Task teams should refer to the World Bank's safeguard policies and work in close consultation with Safeguard Specialists to ensure that the measures developed have accounted for gender-differentiated impacts. In addition to stakeholder consultations, discussed

above, the safeguards cover issues that require gender analysis to ensure that the mitigation measures taken do not shift the risk burden unequally between women and men. These issues include, but are not limited to, the following:

- **Labor and working conditions.** Projects should provide appropriate measures of protection and assistance to address the vulnerabilities of project workers, including specific worker groups (e.g., women, people with disabilities, migrant workers, and children of working age).
- **Resource efficiency and pollution prevention and management.** Projects should not have adverse effects on human health and environment. During their design, construction, and operation, projects should consider technically and financially feasible and cost-effective options that avoid or minimize harmful emissions.
- **Community health and safety.** Projects should be designed, constructed, operated, and decommissioned in accordance with national legal requirements; Environmental, Health, and Safety Guidelines (EHSGs); and other Good International Industry Practice (GIIP), taking into consideration safety risks to third parties and affected communities.
- **Biodiversity conservation and sustainable management of living natural resources.** Projects involving primary production and harvesting of living natural resources are required to assess the overall sustainability of such activities, as well as their potential impacts on local, nearby, or ecologically linked habitats, biodiversity, and communities, including Indigenous Peoples.
- **Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities.** The ESS recognizes that the roles of men and women in indigenous cultures often differ from those in mainstream groups, and that women and children, who frequently have been marginalized both within their own communities and as a result of external development, may have specific needs. Projects are thus required to obtain FPIC in circumstances where the project would have significant impacts on cultural heritage.

## Project Design

In conceptualizing and designing clean cooking and heating projects, project concept notes (PCNs) and project appraisal documents (PADs) should strive to reflect balanced male-female participation in all activities—especially those with technical components or that are traditionally closed off to women. The International Center for Research on Women (ICRW) has

produced a number of Clean Cooking Alliance (CCA)-funded case studies that document progressive company-level practices in the sector. These serve as a useful starting point when thinking about what actions to incorporate into the design of future programs. Suggested recommendations on gender entry points and related activities are as follows:

- **Engage men** since they are often the key decision-makers in their households and communities. Their understanding and support can be critical to the sustained adoption of modern cooking and heating solutions and female relatives' entry into the value chain and future success. Men must understand and embrace the program's objectives and believe that they too have a stake in the outcomes.
- **Actively recruit women** since this may positively affect productivity and/or lead to real political change. Envirofit, Atmosfair (Lesotho), The Paradigm Project (East Africa), The Energy and Resources Institute (TERI) (India), and Qori Q'oncha (Peru) are among the improved cookstoves (ICS) initiatives that purposefully recruit women as stove retailers as this strategy has a positive impact on sales (box 6.7).

### BOX 6.7

#### Corporate policies in Cambodian briquette business create an inclusive work environment for both women and men

The Sustainable Green Fuel Enterprise (SGFE), a social enterprise in Cambodia that produces char-briquettes from coconut shells and other waste materials, makes a conscious effort to employ women. One-third of its staff and management are women, drawn mostly from a community of waste-pickers. SGFE's policies foster equality and an inclusive work environment. For example, they require that all employees' children remain in school, and issue fines for rude behavior. They also offer benefits that are uncommon by Cambodian standards (e.g., marriage and maternity leave, health insurance, paid vacation, and a thirteenth month salary). SGFE's director expressed interest in investing in materials handling equipment that would make jobs less physically demanding for both women and men and would allow for greater female participation.

Source: ENERGIA 2014.

**PHOTO 6.2** Customers at a selling location for charcoal and firewood in Addis Ababa, Ethiopia



© Chris Adam. Used with the permission of Chris Adam. Further permission required for reuse.

- Encourage the use of voluntary targets in hiring, procurement, and portfolio lending or, in countries where permitted, use preferential systems, such as quotas or non-price factor scoring,<sup>2</sup> to increase the number of women in jobs where they are most severely underrepresented. For example, SNV included preferential hiring in its funding agreement in Nepal for the Improved Cookstove Project with Carbon Finance, resulting in women filling 16 percent of jobs, an important achievement where women rarely work outside the home. In Lesotho, a Stove80 distribution project mandated a 50/50 gender mix, opening many new jobs for women (Gold Standard 2016).
- Provide capacity building and training services so that women and men develop the skills and confidence required to engage in opportunities across the value chains, and are not limited to working in micro- and small-scale businesses.
- Pair capacity building with capital input. Capacity building that targets business owners should be complemented by access to seed funding or working capital from the proj-

ect outset. Once women have the necessary skills and a business plan, it is important that no time is lost searching for sources of capital for them to start or grow their enterprises.

- Plan for the future, plan for growth. Putting the necessary support in place will ensure that women-led businesses will not be stranded in isolated markets that have become saturated over the course of the project. A percentage of women aided by the project will succeed and be poised for follow-on support and investment, possibly before the project has terminated.
- Train governments and implementing partners on the business case for gender inclusion and gender diversity in the workforce and share with them some of the practical approaches highlighted in this report. One approach found to be particularly effective is bringing together groups of implementing organizations from various geographies to learn from each other about strategies.<sup>3</sup>

- Don't overlook productive-use opportunities that could be added to the program at a minor incremental cost. Many women are involved in commercial food preparation, heat-intensive agro-industrial processing, and restauration; thus, an existing program's soft infrastructure (e.g., staff, networks, and training facilities) might be leveraged to tack on additional technologies and business models to serve such productive-use needs in addition to domestic ones.
- Determine early on whether cooking-focused projects also have heating-related issues. If so, act quickly to incorporate heating and a focus on gender gaps into all phases of the project development cycle and design since developing countries may lack an understanding of combined cooking-heating technology use and gender. Extra effort and special experts may be needed to mainstream gender into this component (photo 6.2).
- Explore opportunities to leverage women's groups to effect political change. Partners and networks participating in the project may also benefit from development-partner support in organizing and mobilizing to lobby governments, private-sector actors, development partners, and other decision-makers concerning their most pressing issues. For example, women have been instrumental in changing subsidy policies and government support programs for liquefied

petroleum gas (LPG) in several countries (WLPGA 2014), and even successfully lobbied gas companies to provide LPG in smaller, more portable cylinders that were more affordable (Practical Action n.d.).

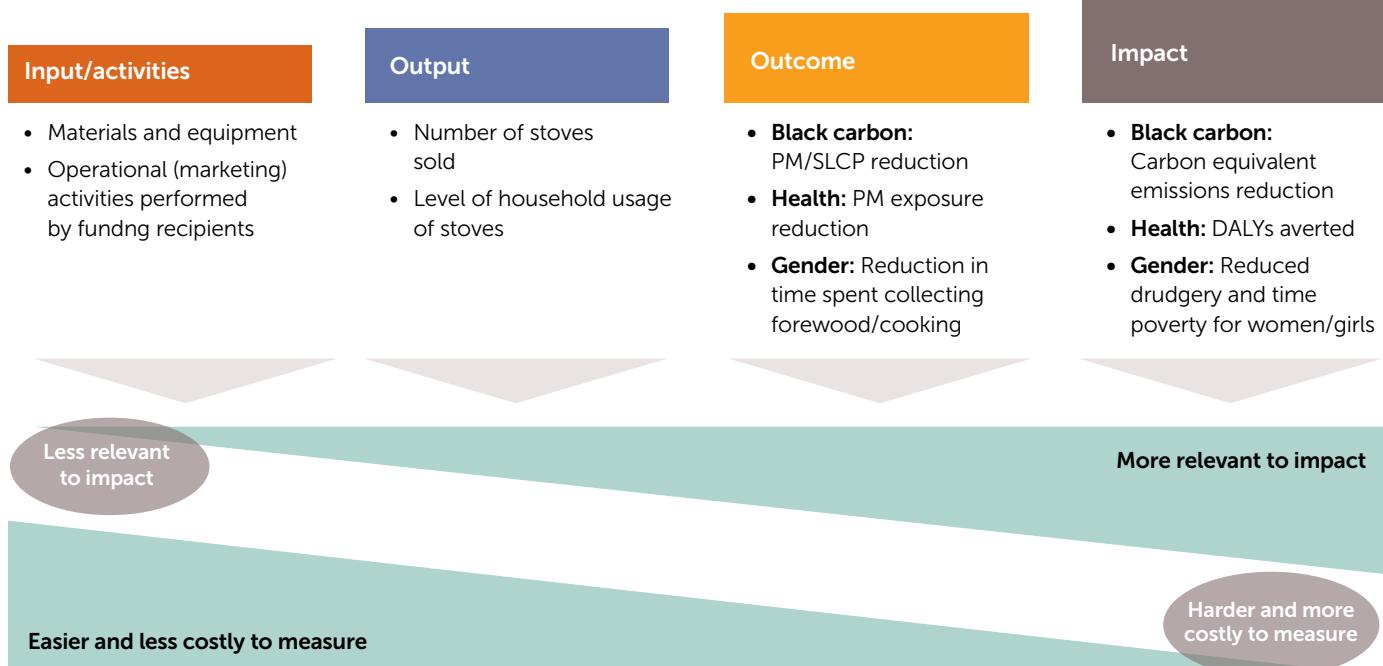
## Monitoring, Verification, and Evaluation

Tracking the progress and performance of clean cooking and heating projects is required to understand whether the interventions are having the desired outcomes and impacts. Indicators provide data that can be measured to develop new research insights and formulate hypotheses. For programs that take a results-based financing (RBF) approach, indicator data trigger payments (figure 6.1). Thus, monitoring, verification, and evaluation (MV&E) must be built into projects that receive the financing (box 6.8). In addition, the level at which measurements are taken must be carefully decided to ensure a balance between MV&E costs and investor interests.

The variables captured by the monitoring frameworks should be informative, useful for making course corrections, and contribute to improving the effectiveness of subsequent projects. Suggested actions for ensuring this occurs are as follows:

- Develop a robust project baseline. Environmental and Social Impact Assessments (ESIAs) and the analysis con-

**FIGURE 6.1** Illustrative metrics spectrum for MV&E



## BOX 6.8

### MV&E: A design component of Clean Cooking Fund–financed projects

The World Bank–hosted Clean Cooking Fund (CCF) treats monitoring, verification, and evaluation (MV&E) as a component of all the projects it supports. At a project's output level, monitoring and verification measures the amount of investments mobilized and the number of households that adopt and use the clean stoves. At its outcome and impact levels, results are measured against improvements in three areas: (i) health, measured as reduced PM<sub>2.5</sub> expo-

sure and averted disability-adjusted life years (DALYs); (ii) gender equality, measured as reduced time women and girls spend collecting firewood and cooking and reduced drudgery and time poverty for women and girls; and (iii) climate, measured as reduced black carbon (BC) and other short-lived climate pollutants (SLCPs), including their carbon equivalent emissions (figure 6.1).<sup>a</sup>

a. Other greenhouse gases (GHGs), including their tons of carbon dioxide equivalent (tCO<sub>2</sub>e), will continue to be quantified and purchased by the World Bank through the Climate Change Group. The CCF will ensure that its activities complement these funds and initiatives

ducted at project preparation and appraisal stages can be used to produce the sex-disaggregated data needed for a baseline. The baseline should clearly showcase the status of women in relation to men prior to the intervention and can use both qualitative and quantitative measures. Collecting data only on women's situation is often inadequate as it does not allow for post-intervention comparisons to determine whether the project is closing, exacerbating, or having no effect on gender gaps. The baseline can be at the level of the community (user), supplier, and/or policy.

- **Don't treat all women as a homogeneous group.** Socio-economic status, cross-referenced with sex-disaggregated data, will provide more useful information. For example, only disaggregating by sex can miss nuances (e.g., caste, income, or marital status) that accord women and men certain gender roles associated with specific barriers. The Clean Cooking Alliance (CCA) and the International Center for Research on Women (ICRW) have put together a [detailed guide on social impact measurement](#), which includes a sample baseline survey.
- Consider that each individual component of the baseline (e.g., separate epidemiological studies) offers an opportunity to collect data. Emissions exposure and health-status surveys can be built into a project's objectives, as in the case of the Lao PDR Clean Stove Initiative (CSI). Universities and research institutes, as well as regional and national stove-testing centers, can be contracted to support taking such measurements, while medical experts and universities

have extensive experience in health baseline and outcome measurements. As in the case of social impact measurements, the guidance of a gender expert would be required to ensure that emissions and health baselines are fully sex-disaggregated.

- **Use appropriate tools for measuring and tracking gender outcomes.** At project preparation, the results framework can be developed, along with indicators, monitoring methodology, and management information systems that reflect gender issues arising from the project. Guidelines for measuring and tracking gender outcomes have been developed by such agencies as the [Asian Development Bank \(ADB\)](#), [Gold Standard](#), [ENERGIA](#), and [SNV, among others](#). Relevant tools and methods include the World Bank's Multi-Tier Framework (MTF), Clean Development Mechanism (CDM), Gold Standard and Verified Carbon Standard (VCS) methodologies, DALYs, Gold Standard Gender Equality Guidelines (2017), and WOCAN/W+ Time Savings Methodology. Currently, the World Bank's Energy Sector Management Assistance Program (ESMAP) is conducting a field study to quantify and measure the climate, health, and gender co-benefits from clean cooking interventions, whose findings will directly fit into the Clean Cooking Fund's MV&E methodologies ([ESMAP 2020](#)). For World Bank task teams, it is important to consult with ESMAP and gender experts assigned to the projects for up-to-date guidance as the tools and methods are constantly evolving.

- Utilize both quantitative and qualitative indicators to capture parts of the project's results chain. Ideally, these indicators should be sex-disaggregated and able to be accurately and cost-efficiently measured and reported. Preferably, a combination of indicators should be used to track the project's activities (e.g., training or financing women-led cookstove businesses), outcomes (e.g., increased revenue generated and jobs created, with sex-specific group performance compared to the baseline), and impacts (e.g., sex-disaggregated business longevity, growth and increased wealth and well-being of the business owner's family, and impact of clean cooking on household health and welfare). Thus, use of a logical framework (logframe) for monitoring and assessment is advised.
- Choose other indicators that can be strategically used to fine-tune the project approach—as opposed to more generally documenting progress—by generating actionable lessons. Kopernik, for example, collected ongoing data on the time female entrepreneurs spent on their businesses, the involvement of their spouses, their previous employment, their access to motorbikes, and much more in order to tease out correlations with business performance (box 5.4). This information was shared with others and used to adapt and improve implementation approaches. These instrumental-type indicators usually arise from some hypothesis that project designers or implementers want to test and suspect may be important. Sometimes the usefulness of such “excess” data collected at the project baseline in establishing correlations is discovered only later. However, the monitoring burden on women and men must be closely tracked in order to avoid taking too much of individuals’ time and ensure appropriate compensation for that time, coordinating with other studies to reduce redundancies where possible.
- Keep the monitoring framework open to unintended outcomes, both positive and negative. This means including certain open-ended questions in follow-up surveys and having a codified way to collect, record, and report on surprising or counterintuitive observations (e.g., from staff, participants, and beneficiaries), as oftentimes these insights never make it into formal project documentation. Examples of unintended negative impacts include repercussions from the new technologies that do not cook food or heat as expected or cause food to burn; women’s increasing economic power attracting sanctions against them, including violence, often in the short term (Ferrari and Iyengar 2010); or women finding themselves with increased work burdens as a result of adopting the new technologies (e.g., increased water collection or digester-related work for biogas plants). In addition, women’s increased economic responsibilities from their new incomes could wipe out the expected economic and other gains and thus fail to translate into increased status. Unanticipated positive outcomes are also possible.
- Explore the permanence of the effected change at project completion and capture lessons in a way that can be applied to future endeavors. Gender norms usually evolve slowly and sometimes in unexpected ways; thus, sustaining project gains can be challenging. For World Bank projects, the implementation completion report (ICR) should detail the gender-related outcomes and impacts that the project has realized, as well as future risks to sustaining them. It is also desirable that future projects have the opportunity to learn from and build on the gender and clean-stove experience base so that lessons can be adapted to other sectors or geographies, as needed.

## Budget Issues and Human Resources

Making clean cooking projects inclusive and fair to both women and men can result in significant performance benefits without a significant cost increase. By identifying opportunities for gender inclusion and equality early in the project cycle, high-cost, high-value activities can be properly budgeted for and no- or low-cost items can be integrated into planning (box 6.9). Waiting until later can make it quite difficult to course-correct (e.g., determining halfway through project implementation that the stove design developed or selected is unattractive to mainly female end users). Also, it is difficult to measure gender-related outcomes without having collected the relevant data during the baseline survey. Similarly, it is hard to ensure the inclusion of women-led enterprises in an RBF program without having started outreach and business development efforts well in advance.

Starting at project inception, planning is needed to ensure that activities are properly resourced and that the right experts are on hand. Additional budget allocations are often necessary for analysis (e.g., for single-sex FGDs, participatory exercises, field visits, and key informant interviews). It is advisable to have a dedicated gender expert work in close consultation with the social development and environmental specialists in order to complete this phase. While hiring a gender expert might appear to increase a project’s costs compared to having other team

## BOX 6.9

### Using technical assistance funds to close gender gaps

The Rwanda Energy Access and Quality Improvement Project (EAQIP), a US\$20 million project co-financed by the World Bank–hosted Clean Cooking Fund (CCF) and the IDA, at US\$10 million each, demonstrates how technical assistance funds can be used to integrate gender considerations into project design. Under the EAQIP's US\$12 million sector-studies component,<sup>a</sup> a technical assistance subcomponent includes the following gender-specific activities:<sup>b</sup>

- Monitoring gender inclusion in the modern-energy access components;

- Identifying and analyzing further gender gaps in the sector to provide tailored and targeted measures for bridging them;
- Providing project staff training in gender mainstreaming; and
- Conducting awareness-raising, behavioral-change, and entrepreneurship events to attract female participation in the program.

The EAQIP's approach to addressing gender gaps can be replicated in other projects that similarly seek to improve household access to modern-energy cooking solutions.

a. The sector-studies component focuses on improving the efficiency of sector performance and informing appropriate decision-making during and after project implementation (e.g., through conducting economic and non-economic impact evaluation studies).

b. Gender-related technical assistance will also be developed under the EAQIP's capacity-building subcomponent.

members weave gendered analysis throughout their work, the alternative can be problematic. For example, task team members' scope of work may be expanded without setting aside adequate time to complete it, leading to feelings of ineffectiveness or even resentment. Especially since gender may represent a novel subject area, extra time must be allocated to supporting the learning curve. For these reasons, hiring a dedicated gender expert may be well worth the project expense. That said, it is possible that, with sufficient time and support, the roles of other project team members could be expanded to assume this responsibility. Through ESMAP, World Bank task teams can get advice, as well as financial support, for carrying out gender analyses as part of project preparation.

### Notes

1. Namely, that consent is required in addition to consultation; that it be given in the absence of coercion or manipulation; that it occur sufficiently in advance of planned activities; and that it be based on satisfactory information in an appropriate format, including costs and drawbacks in addition to anticipated benefits.
2. Set-asides, procurement fulfillment targets, and preferential scoring are not currently permitted under World Bank procurement rules; however, tenders may consider value for price.

3. ENERGIA's Women's Economic Empowerment program adopted this approach, which yielded considerable lateral learning and spurred innovation.

### References

- ADB (Asian Development Bank). 2017. *Asian Development Bank Annual Report 2017: Sustainable Infrastructure for Future Needs*. Manila: Asian Development Bank.
- EBRD and CIF (European Bank for Reconstruction and Development and Climate Investment Funds). 2016. *Gender Mainstreaming in District Heating Projects in the Commonwealth of Independent States: A Toolkit*. [https://www.climateinvestmentfunds.org/sites/cif\\_enc/files/knowledge/documents/gender\\_mainstreaming\\_in\\_district\\_heating\\_projects\\_-english.pdf](https://www.climateinvestmentfunds.org/sites/cif_enc/files/knowledge/documents/gender_mainstreaming_in_district_heating_projects_-english.pdf).
- EIGE (European Institute for Gender Equality). 2021. "Gender Budgeting: Gender Mainstreaming Tool." <https://eige.europa.eu/gender-mainstreaming/methods-tools/gender-budgeting#2>.
- ENERGIA. 2014. "Women's Entrepreneurship Delivering Sustainable Energy for All." *ENERGIA News* 15 (1): 13–14.
- ESMAP (Energy Sector Management Assistance Program). 2020. *Quantifying and Measuring Climate, Health, and Gender Co-Benefits from Clean Cooking Interventions: Methodologies Review*. Washington, DC: World Bank.
- Ferrari, G., and R. Iyengar. 2010. "Discussion Sessions Coupled with Micro-financing May Enhance the Roles of Women in Household Decision-Making in Burundi." Discussion Paper No. CEPDP1010. London: Centre for Economic Performance (CEP), London School of Economics and Political Science. [http://cep.lse.ac.uk/\\_new/publications/abstract.asp?index=3694](http://cep.lse.ac.uk/_new/publications/abstract.asp?index=3694).

- Gold Standard. 2016. "Gold Standard Improved Cookstove Activities Guidebook: Increasing Commitments to Clean-Cooking Initiatives." [https://www.goldstandard.org/sites/default/files/documents/gs\\_ics\\_report.pdf](https://www.goldstandard.org/sites/default/files/documents/gs_ics_report.pdf).
- IMF (International Monetary Fund). n.d. "Women's Empowerment and the IMF." International Monetary Fund, Washington, DC. <https://www.imf.org/external/pubs/ft/gender/IMFWomensEmpowerment.pdf>.
- Practical Action. n.d. "Low Smoke Stoves Project (LPG)." <https://practicalaction.org/our-work/projects/clearing-the-air-in-darfur/>.
- RSPN (Rural Support Programmes Network). 2011. "Gender Mainstreaming in the Pakistan Domestic Biogas Programme (PDBP)." Final Report. <http://www.rspn.org/wp-content/uploads/2013/12/gender-mainstreaming-in-pdbp-final-report-october-2011.pdf>.
- WLPGA (World LPG Association). 2014. "Cooking with Gas: Why Women in Developing Countries Want LPG and How They Can Get It." <https://www.wlpga.org/wp-content/uploads/2015/09/2014-cooking-with-lpgas-women-report.pdf>.



For women in post-conflict El Fasher, Darfur, the installation of LPG stoves under Practical Action's Low Smoke Stove Project has made cooking safer, cleaner, and less expensive. Over the 10-year life of this women-managed carbon credit project—the first in Sudan—it is expected that switching from charcoal to LPG cooking will cut some 400,000 tons in CO<sub>2</sub> emissions. © Olivier Levallois. Used with the permission of Olivier Levallois. Further permission required for reuse.

# 7 Closing the Gaps

Women have long been recognized as primary users of household cooking and heating energy and beneficiaries of projects focused on clean cooking and heating solutions. However, current best practice in bridging gender gaps requires a higher ambition that actively seeks and creates entry points for women's engagement across the value chains. To date, women have often been clustered in micro- and small-scale operations, last-mile retail sales, artisanal equipment manufacturing, and biomass-based fuel supply. Many examples highlighted in this report demonstrate women's important role in the expansion of cookstove sales, particularly in previously neglected market segments. Owing to their knowledge and experience, women's active engagement can reduce the failed uptake of clean-stove products and services and increase the likelihood of their continued use.

Value-chain positioning, which influences access to finance and other key inputs, should be a key consideration of clean cooking or heating programs aiming to integrate greater gender equality. Addressing the stark gender disparities in economic and political realms requires actively advancing women's engagement in larger-scale, capital-intensive areas across the value chains. At higher levels, where sales volumes are greatest, women-led enterprises are still significantly underrepresented (Sesan et al. 2019).

As traditional managers of household energy, women can also play a significant role in energy planning and policy making. Currently, women are severely underrepresented in leadership positions within the industry and at national and global policy levels (UN Women n.d.).

When adopting the guidance provided in this report, it is important that project task teams engage with relevant stakeholders to ensure that project-related gender issues are accurately understood and that processes are adapted to local contexts and cultures. In addition to recognizing women as mainstream users, producers, and consumers of cooking energy, teams should consider men as an internal stakeholder group and not miss opportunities to work with them.

Equally important are appropriately documenting the gender outcomes realized as part of clean cooking or heating interventions and ensuring that unintended negative consequences are avoided. As the application of results-based financing (RBF) and other impact-driven financing mechanisms picks up pace, the need for effective impact verification becomes even more critical. Well-designed programs that incorporate robust methods for impact measurements could therefore benefit from impact investment funds that can sustain their operations.

## References

- Sesan, T., M. Clifford, S. L. Jewitt, and C. Ray. 2019. "We Learnt That Being Together Would Give Us a Voice: Gender Perspectives on the East African Improved-Cookstove Value Chain." *Feminist Economics* 25 (4): 1–27. doi: 10.1080/13545701.2019.1657924.  
UN Women. n.d. *Women and Sustainable Development Goals*. Nairobi: UN Women Eastern and Southern Africa Regional Office. [2322UN Women Analysis on Women and SDGs.pdf](#).





