

# EXPOSING THE GENDER GAPS IN FINANCING CLIMATE CHANGE MITIGATION – AND PROPOSING SOLUTIONS



# ACRONYMS

<b>AEPC</b>	Alternative Energy Promotion Centre (Nepal)
<b>AEI</b>	Africa Electrification Initiative
<b>AFREA</b>	African Renewable Energy Access Program (of the World Bank)
<b>AMADER</b>	Agency for the Development of. Household Energy and Rural Electrification (Mali)
<b>BRT</b>	Bus Rapid Transport
<b>BSP</b>	Biogas Support Programme
<b>BSP-Nepal</b>	Biogas Sector Partnership-Nepal
<b>CDKN</b>	Climate and Development Knowledge Network
<b>CDM</b>	UNFCCC Kyoto Protocol's Clean Development Mechanism
<b>CER</b>	Certified Emission Reduction
<b>CIF</b>	Climate Investment Funds
<b>CO2e</b>	Carbon Dioxide Equivalents
<b>COP</b>	Conference of the Parties (of the UNFCCC)
<b>DGIS</b>	Directorate General for International Cooperation of the Netherlands
<b>ENERGIA</b>	International Network on Gender and Sustainable Energy
<b>ESMAP</b>	Energy Sector Management Assistance Program
<b>GEF</b>	Global Environment Facility
<b>GGCA</b>	Global Gender and Climate Alliance
<b>GoN</b>	Government of Nepal
<b>GTZ</b>	Gesellschaft für Technische Zusammenarbeit (German Technical Cooperation Agency)
<b>HEURA</b>	Household Energy and Universal Rural Access (Mali)
<b>IRMC</b>	Integrated Resource Management Consultancy
<b>KfW</b>	German Development Bank
<b>PoA</b>	Programme of Activities
<b>PV</b>	Photovoltaic (solar energy technology)
<b>SEI</b>	Stockholm Environmental Institute
<b>SGP</b>	Small Grants Programme (of the UNDP/GEF)
<b>SNV/N</b>	Netherlands Development Organization in Nepal
<b>SREP</b>	Scaled-Up Renewable Energy Program
<b>UN</b>	United Nations
<b>UN Women</b>	United Nations Entity for Gender Equality and the Empowerment of Women
<b>UNDP</b>	UN Development Programme
<b>UNECE</b>	United Nations Economic Commission for Europe
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>UNIFEM</b>	United Nations Development Fund for Women
<b>WEDO</b>	Women's Environment and Development Organization
<b>WHO</b>	World Health Organization

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# I. OVERVIEW

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## A. INTRODUCTION

As the harmful impacts of climate change have become increasingly apparent, a number of international funds and mechanisms have been established to support initiatives designed to reduce greenhouse gas emissions. Many of these projects in developing countries have been supported through funding sources related to the UN Framework Convention on Climate Change (UNFCCC) – particularly the Global Environment Facility and the Clean Development Mechanism. When the UNFCCC's new Green Climate Fund becomes operational, it is expected to mobilize substantial amounts of public and private financing for developing countries to reduce their emissions and adapt to climate change.

Until recently, few climate change mitigation projects considered gender equality as an important factor, despite evidence that women in developing countries are disproportionately affected by climate change and play important roles in effective responses to those changes.

Too often, women's concerns are not taken into account in climate change mitigation discussions due to social and political inequities. If they are considered at all, they may be seen more as victims of climate change than as active leaders and participants in solutions and responses. Lack of attention to women's needs may lead to interventions that reinforce existing gender inequalities and deepen the negative effects women experience due to climate change. Yet women and girls can be key actors, contributors, and agents of change in climate initiatives – particularly if they are actively engaged in the planning, implementation and decision-making processes.

Overall, gender issues are not well understood by many practitioners involved in climate mitigation initiatives and financing mechanisms. This is not surprising, as the prevailing approaches to reducing emissions have prioritized scientific and technical measures.

Many of the mitigation projects and funds so far have supported large-scale energy infrastructure and industrial efficiency programs that seem to have little connection with gender equality or other social issues. These have been widely viewed as 'gender neutral;' however, a broader focus on economic and social impacts can reveal gender differentiated impacts from these investments, as in cases where energy generation facilities require plans for resettlement of communities or designs for local compensation and benefit schemes.

In addition, there are other types of climate change mitigation initiatives in which attention to gender balance and inclusion is necessary for the overall success and sustainability of the project. Efforts to promote public acceptance of new low-emission energy technologies, transportation modes, and agricultural techniques require the involvement of a large number of people from civil society, including both men and women. Attention to gender equality can improve the effectiveness of these projects, i.e. maximizing emission reductions when more women are involved due to greater efforts to address their needs and perspectives.

In the UNFCCC context, climate mitigation projects and investments are also expected to support the sustainable development goals of developing countries. The economic and social benefits of these activities are generally important factors for the governments and citizens of these countries and are critical for community acceptance and long-term viability. In evaluating these benefits, gender differences are important factors to consider, as the differing societal roles of men and women result in differences in their needs and priorities, and in the impacts of climate-related projects.

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As a result of concerted advocacy efforts, the Global Environment Facility, the Climate Investment Funds, and new UNFCCC entities such as the Green Climate Fund and the Climate Technology Centre and Network, have specific requirements for taking gender into account. Equality between men and women is recognized as an important goal in and of itself, and a critical element in the success and sustainability of climate change mitigation initiatives. However, there is a widespread lack of knowledge about exactly how to address these concerns.

This report highlights three projects that have received climate change mitigation financing and included attention to gender at some stage of their implementation: the **Nepal Biogas Support Program, Household Energy and Universal Rural Energy in Mali**, and the **Bogotá, Colombia TransMilenio Bus Rapid Transit System**.

Some of the lessons drawn from these and similar projects can be helpful going forward as new efforts are made to integrate gender considerations into public and private climate mitigation projects and financing. These lessons include the following:

- Gender mainstreaming throughout the project is essential to its success since results are most effective when gender issues are integrated from the outset.
- Socially disaggregated data that are intentionally gathered throughout the project cycle supports more effective projects. Systematic gender-focused data collection, targets, and indicators help to properly analyze and demonstrate the benefits of paying proper attention to gender equality in climate change mitigation.
- Economic and social co-benefits, for both men and women, help secure national and community support for activities that contribute to climate change mitigation, and ensure their long-term viability.
- Integration of gender equality issues affects project efficacy and impact, e.g., by improving the results of large-scale transport and grid-based energy infrastructure projects, as well as small-scale, off-grid initiatives.
- Gender sensitive government and institutional policies are key factors in the formulation of more inclusive climate mitigation measures and investments.
- Many governments, funders, and institutions need guidance on how to incorporate gender considerations in ways that lead to more effective and inclusive projects, in which benefits are shared equitably.

In addition, this report presents a number of analyses, tools and guidance materials put together by GGCA members and other organizations. These materials outline and illustrate specific steps that can be taken to promote gender mainstreaming in a variety of projects, policies, and institutions, especially in the context of climate change mitigation.

Despite these insights, it is important to recognize that the focus on gender in climate change mitigation is just beginning. Much more research and analysis are needed in order to establish and document methods through which attention to gender equality can improve the overall effectiveness and long-term sustainability of climate change mitigation activities. One of most important gaps is the lack of gender differentiated data regarding public participation in and contributions to climate change mitigation projects, and the economic and social benefits of those projects.

## B. GROWING ATTENTION TO GENDER EQUALITY ISSUES IN CLIMATE CHANGE MITIGATION FINANCING

An initial review of documents (GGCA, WEDO, 2013) discussing gender considerations in climate change mitigation projects indicated that, so far, there has been only limited application of gender mainstreaming approaches; however, the situation is beginning to change.

In response to critiques of the prevailing 'gender neutral' perspective, there has recently been significant movement towards greater attention to gender within the UNFCCC.

In 2010, a decision of the 16th UNFCCC Conference of the Parties (COP 16) specifically recognized that gender equality and the effective participation of women are important factors for effective action on all aspects of climate change (UNFCCC, 2010a).

And during the COP 18 in December 2012, governments adopted a new decision on promoting gender balance and improving the participation of women in climate change negotiations and decision-making bodies "so that gender-responsive climate policy responds to the differing needs of men and women in national and local contexts," and the issue of gender and climate change was also added as a standing item on the agenda of the COP (UNFCCC, 2012a). This decision came in response to several years of advocacy for gender equality amid concerns that previous decisions to promote gender-sensitivity in UNFCCC activities, policies, and institutions were not adequately implemented.

The governing instrument for the new UNFCCC Green Climate Fund specifically calls for taking a "gender-sensitive approach" from the very beginning of projects – as an element of the broader objective of pursuing environmental, social, economic, and developmental co-benefits from climate change mitigation and adaptation actions (GCF, 2011). Similarly, the new Climate Technology Centre and Network, which is being set up to stimulate cooperation in the technology sector and enhance the development and transfer of technologies, is directed to take gender considerations into account (UNFCCC 2012b).

In addition to UNFCCC actions, in April 2013, the Joint Trust Fund Committee for the Climate Investments Funds (CIFs) managed by the World Bank approved the findings of a gender assessment emphasizing that gender is "a driver for transformational change and central to the effectiveness and efficiency of CIF programming" (JTF, 2013). The assessment went on to recommend steps to ensure that the benefits of CIF programs will reach recipients equally in order to achieve "sustainable and transformational change towards low-carbon and climate-resilient development" (JTF, 2013). To support these steps, the committee also approved the allocation of funds for the recruitment of a gender specialist within the CIF Administrative Unit.

These mandates represent significant opportunities for introducing gender mainstreaming as a way of improving the effectiveness and equity of climate-related projects and financing. Going forward, it is important to document the benefits of gender mainstreaming in designing and implementing effective emission reduction initiatives involving both public and private funding – especially as much of the financing for climate mitigation going forward is expected to come from the private sector, where there may be little experience in considering the relevance of social equity factors in investment decisions.

This report examined projects that could potentially serve as models and/or provide lessons for gender sensitive climate change mitigation activities. In this context, many of the projects identified were funded either through the Global Environment Facility or the UNFCCC Clean Development Mechanism. A table displaying other gender and climate-related funds can be found at this [link](#). In addition, several reports also

more broadly discuss gender and climate-related funds, which can be found in the bibliography.

## **C. GENDER MAINSTREAMING IN THE GLOBAL ENVIRONMENT FACILITY'S CLIMATE CHANGE MITIGATION ACTIVITIES**

The Global Environment Facility (GEF) serves as the financial mechanism for the UNFCCC and other international conventions. Its focus is on financing the 'incremental' or additional costs of transforming projects with national benefits into ones with global environmental benefits; for example, by using renewable energy sources for power generation rather than fossil fuels, global greenhouse gas emissions can be reduced.

In 1996, the GEF adopted a policy on stakeholder participation that encouraged the involvement of women in designing and implementing projects, especially ones impacting the incomes and livelihoods of local communities; however, there was little systematic application of this policy or evaluation of gender impacts (Gender Action et al, 2010).

In May 2011, the GEF Council adopted an explicit Policy on Gender Mainstreaming, which aims to further the goal of gender equity and states that "project results can often be superior when gender considerations are integrated into the design and implementation of projects, where relevant" (GEF, 2011). All the Partner Agencies (UN agencies and development banks) that implement GEF projects are now required to have policies, strategies, or action plans that promote gender equality.

As the GEF implementing agencies move towards greater integration of gender considerations in the design and implementation of climate change mitigation projects, they – and other financing institutions – can look to some existing GEF projects that can serve as useful examples. One of these is the Household Energy and Universal Rural Access in Mali, which is discussed in detail as one of the case studies in this report.

Other examples can be found in the work of the GEF Small Grants Programme, which is administered by the UN Development Programme (UNDP). It supports community and non-governmental organizations in providing access to clean energy and sustainable transport, and improving energy efficiency and land use practices, as ways of reducing global greenhouse gas emissions. As these projects are implemented at the community level, with women as important stakeholders, they have been more likely than larger projects to pay attention to social equity issues.

### **Gender sensitive greenhouse gas emission reduction projects that are supported by UNDP/GEF:**

The Pakistan Fuel Efficiency in the Road Transport Sector project made targeted efforts to engage women in the development of a market for vehicle tune-ups to improve fuel efficiency by implementing demonstrations, training, financing, and an awareness campaign about fuel efficiency (UNDP, 2005).

The Mekhe Solar Cooker Project in Senegal has reduced greenhouse gas emissions and deforestation and increased women's incomes by training women how to use and maintain solar cookers and ovens, and to start new businesses using this equipment (UNDP, 2012a).

The Barefoot College in India teaches women (including village women from Africa and Latin America) how to fabricate, install, and maintain solar home lighting systems (UNDP/GEF, 2011).

## D. INCREASING ATTENTION TO GENDER EQUALITY IN CLEAN DEVELOPMENT MECHANISM PROJECTS

The UNFCCC Kyoto Protocol's Clean Development Mechanism was designed to promote investments in developing countries by more industrialized nations through emission reduction projects that also support sustainable development goals in the host countries. Yet, while there are several measures and methods available to measure progress on greenhouse gas emissions reductions, there are no specific requirements for CDM projects to deliver on their sustainable development goals. Consequently, there has often been more focus on the emission reduction component than social and economic development issues, and much of the available funds for CDM projects so far has gone to large-scale energy efficiency projects.

Smaller scale projects with a lower volume of emission reductions have found the CDM procedures costly and complicated, limiting their ability to access this source of financing. As a result, there has been less CDM funding used to support household level and community-based projects, which are more likely to provide sustainable development benefits and opportunities for local people – and to engage women.

In 2007, the CDM approved a methodology through which a number of small, related projects can be bundled together for emission reduction credits as a 'Programme of Activities' (PoA), thereby reducing transaction costs and opening up wider access to this funding source. This has expanded the reach of the CDM, and also allowed greater opportunities for women and women's groups to obtain benefits from CDM financing.

A 2010 report from the Ministry of Foreign Affairs of Finland on Gender and the Clean Development Mechanism observed that the programmatic CDM methodology allowing for aggregation of a large number of projects involving household level biomass and biogas, solar energy, and off-grid electricity systems has more potential for simultaneously delivering greater sustainable development benefits and better emission reductions than typical large-scale CDM projects. The report also presented a gender tool to identify potential gender positive impacts of planned CDM projects (Finland, 2010).

In November 2012, the UNFCCC issued an updated CDM Methodologies Booklet that contained a section identifying certain methodologies that have a distinct potential to directly improve the lives of women and children. These methodologies are those that:

- increase access to affordable household fittings and appliances, e.g., lights, refrigerators, and other appliances;
- optimize tasks typically undertaken by women or children, e.g., fuel wood gathering, and cooking water collection;
- improve the living environment of women and children, e.g., through better air quality, heating, and lighting;
- use community-based participatory approaches that enable women and children to learn about projects and contribute to decision-making processes; and
- generate new local employment opportunities for women, e.g., in forestry activities (UNFCCC, 2012c).

In addition, the UNFCCC produced a publication CDM and Women to highlight some of these gender-friendly methodologies, as well as the work being done by the UNFCCC Secretariat to enhance gender equality in the CDM process. The publication emphasizes the link between gender equality and the CDM's sustainable development goals, a correlation that provides a compelling justification for focusing on

women and promoting their active participation in CDM projects (UNFCCC, 2012d).

The aggregation of cookstove projects is one area where there is significant potential for CDM financing to support greenhouse gas emission reductions by mobilizing women, and also improving their health, incomes, and economic opportunities. Several billion people in developing countries use traditional, inefficient biomass stoves for cooking and lighting, which causes indoor and outdoor local air pollution and also contributes to global climate change. Carbon credits from cookstove projects could exceed one billion tons of carbon dioxide equivalents (CO<sub>2</sub>e) per year, according to researchers (Muller et al., 2011). Women can receive direct benefits by being able to sell the credits, as well as indirect economic co-benefits by spending less time and effort acquiring firewood and other fuels and therefore being able to pursue other income-generating occupations.

Rural electrification programs using CDM PoA financing can also benefit from efforts to include women. Grameen Shakti's Installation of Solar Home Systems in Bangladesh, for example, uses CDM credits to support social entrepreneurship and micro financing for distribution of solar home systems in rural villages. A major aspect of the business strategy involves training women to work in solar production, marketing, repair, and maintenance services, and to become renewable energy entrepreneurs (UNFCCC, 2007).

Two similar CDM projects were selected as case studies for this report, both certified as CDM Programmes of Activities:

1. The Nepal Biogas Support Program reduces greenhouse gas emissions by replacing inefficient stoves that burn wood and other biomass fuels with locally produced biogas systems. Following an ENERGIA-led gender assessment, the program focused on engaging more women in ownership, leadership, and skilled employment, as well as in community credit cooperation groups for purchasing biogas systems.
2. The Bogotá, Colombia TransMilenio Bus Rapid Transit project is the first mass transportation project to received PoA certification. It has lowered greenhouse gas emissions and improved living conditions by reducing the use of private cars and mini-buses. It incorporated certain measures to make the system attractive to – and provide employment opportunities for – women as well as men.

## II. CASE STUDIES

### A. CONTRIBUTIONS OF A GENDER ASSESSMENT TO THE PERFORMANCE OF THE NEPAL BIOGAS SUPPORT PROGRAM

#### Project overview

The Biogas Support Programme (BSP) started in July 1992 with funding from the Directorate General for International Cooperation of the Netherlands (DGIS) of the Netherlands government through the Netherlands Development Organisation in Nepal (SNV/N) and the Government of Nepal (GoN). Biogas is composed primarily of methane and carbon dioxide resulting from decomposition of organic materials in the absence of oxygen. It is produced by mixing water and feedstock material (including animal dung and human waste) and allowing it to decompose in an airtight tank (digester) that is kept underground. The digester input can be connected directly to cattle stalls and toilets. Inside the digester, the gas rises and can be piped to nearby households. When burned, biogas produces very little smell or smoke. The semi-fluid affluent from the digester, 'slurry,' can be applied to fields as fertilizer. The BSP was designed to promote

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locally produced biogas for cooking and lighting in rural areas, replacing the firewood and agricultural residues primarily in use. This substitution was intended to provide improved energy services, reduce deforestation rates and related land degradation; in addition, it has worked to decrease Nepal's greenhouse gas emissions.

Other significant socioeconomic, health, and environmental benefits associated with the switch to biogas include:

- reduction in the amount of time spent by women and girls in collecting fuel and managing fires, therefore increasing their opportunities for income-generating or educational activities. Specifically, it has increased school attendance among girls since they no longer spend as much time collecting fuelwood and helping with household chores.
- less smoke in homes and communities, reducing the incidence of respiratory disease, eye ailments, and other health issues;
- better sanitation practices since solid wastes (including waste from toilets) are processed to produce biogas; and
- improved soil productivity as the slurry from biogas digesters is applied to agricultural land (UNFCCC, 2011).

Since 2003, with additional support from the Directorate General for International Cooperation of the Netherlands (DGIS) and the German Development Bank (KfW), the biogas program has gradually progressed through various phases of expansion and improvement in introducing household biogas digesters and stoves, and building up the capacity of private sector enterprises to manage plant installations and after-sales services (SNV, 2010).

With increased dissemination of the technology throughout the rural areas of the country, the project has demonstrated a great potential for contributing to climate change mitigation. In 2005, it succeeded in registering as a Program of Activities under the Clean Development Mechanism (UNFCCC, 2011). Through this program, Nepal has demonstrated how a least developed country can pursue its sustainable development goals while also reducing its greenhouse gas emissions.

As part of an initiative on 'Gender Mainstreaming in Energy Projects,' in 2009 ENERGIA provided support to the Biogas Sector Partnership-Nepal in undertaking a gender assessment of the National Biogas Support Program. Given the fact that most biogas users are women, it seemed clear that integrating gender sensitive plans and a gender mainstreaming approach in activities to promote and disseminate the technology would make the program more responsive to users' needs and more sustainable over time. The assessment identified gender gaps in ownership, construction, management, and servicing of the biogas systems, and recommended measures to increase women's engagement and contributions to the success of the program through a gender mainstreaming plan. These measures included targeted training to increase women's leadership in biogas promotion, construction, and operation, and incorporation of gender-based indicators in the yearly surveys (BSP Nepal 2009). Collection of gender sensitive indicators in the annual user surveys highlighted the differences in gender-based roles and responsibilities, leading to more awareness within the sector of the benefits of greater inclusion of women.

## Introduction of biogas systems for Nepal

Nepal's Alternative Energy Promotion Centre (AEPCC) was established in 1996 to develop and promote renewable and alternative energy technologies. In Nepal, fuel wood is the main source of energy for heating and cooking purposes and the forest remain the single most important source for firewood, particularly for rural people. Forests account for 78 percent of energy consumption (Bhusal, 2012) and between 2002-2010, this caused a 3.75 percent reduction in forest cover (Pandit S., 2011).

There appeared to be substantial potential for a widespread transition to locally produced biogas as a substitute fuel, especially in light of the difficulties and costs involved in transporting other types of fuels and equipment to remote mountainous areas. Many rural households in Nepal have some cattle, thereby ensuring sufficient supplies of manure for biogas production; there is also adequate water for operating these systems.

In 2003, the Biogas Sector Partnership-Nepal was established as a separate, dedicated institution. In addition to obtaining funds to support construction of biogas digesters, there was also a need for different types of technical assistance and capacity building, including the introduction of quality control measures and standards, training for biogas technicians and skilled laborers, monitoring programs, and extension services.

While some studies have shown that the technical potential for biogas expansion in Nepal ranged between 1.3 and 1.9 million systems based on geographical conditions and the availability of water and cattle dung, a 2005 study concluded that the economically viable number was closer to 600,000 (Karki, Shrestha & Bajgain, 2005).

### Project phases

- In its first phase (1992-1994), the Nepal Biogas Support Program (funded by DGIS and implemented by SNV) aimed to build 7,000 household biogas digesters, promote the use of this technology, and work towards building viable private sector enterprises.
- The second phase (1994-1997) aimed to build an additional 13,000 digesters, continue to promote biogas, and establish a body to coordinate the various stakeholders working in the sector.
- In the third phase (1997-2003), the main objective was to further expand the sector as a sustainable rural energy source. By the end of the third phase, a total of 111,395 biogas plants were installed in different rural areas of Nepal (UNFCCC, 2012), and the non-governmental organization, Biogas Sector Partnership-Nepal (BSP-Nepal) was established to take over the implementation of the program in Phase IV.
- During its fourth phase (2004-2010) the Biogas Support Program aimed to install 200,000 biogas plants, and also submitted an application to be registered as a Clean Development Mechanism project based on its potential for reducing greenhouse gas emissions. The program reported that by the end of 2007 it had reached 67 out of 75 districts in Nepal and that 174,075 digesters had been constructed (BSP-Nepal, 2009).
- In December 2005, the program was officially registered as a CDM PoA project (UNFCCC, 2005).

## Importance for climate mitigation

The Clean Development Mechanism allows industrialized countries to earn certified emission reduction (CER) credits by collaborating on climate change mitigation projects in developing countries. BSP-Nepal had the objective of making the biogas industry a market-oriented sector and phasing out donor support by channeling revenues received from the sale of carbon credits directly to the commercial enterprises installing the biogas systems and serving the country's rural areas (UNFCCC, 2005).

The PoA design document indicated that the program would support large-scale installation of biogas systems by: providing financial support for purchasers/end-users through microfinance institutions and cooperatives; utilizing a uniform design of biogas plants; overseeing marketing, quality control and monitoring; and implementing an extension program concerning use of the slurry as fertilizer (UNFCCC, 2005).

The BSP-Nepal activities registered under the CDM are designed to extend over a period of 21 years and aim to reduce greenhouse gas emissions by avoiding the combustion of non-renewable biomass. The expected emissions reductions were determined with the help of information learned through a baseline survey of the amount of traditional biomass fuel used (wood, dung, and agricultural wastes) and the estimated amount to be replaced by use of biogas. The expected CERs from this program were close to 50,000 tons of carbon dioxide equivalent per year, and an overall total of almost 2 million tons (UNFCCC, 2011).

In most cases, CDM projects are gender neutral or do not explicitly indicate the role of women and gender equality (Finland, 2010). This was initially true for the Nepal registration, but it did subsequently focus on the role of women during the implementation stage and made an effort to integrate gender considerations after conducting the assessment in 2009.

## Gender considerations

Since women are primarily responsible for household cooking and fuel supplies, it was expected that they would be the ones to benefit the most from the biogas systems. Women in households with biogas systems save time in fuel management, and also benefit from easier and healthier cooking conditions. However the biogas system requires collection and the mixing of water with dung, and this represents additional work for women (Bajgain & Shakya, 2005).

<b>Time impact of a biogas system for a typical rural household</b>			
<b>Change in Time Spent</b>			
<b>Activities</b>	<b>Before</b>	<b>After</b>	<b>Time saved in minutes</b>
Collection of fuelwood*	156.7	91.28	66
Dung collection*	3.07	1.73	1
Agro-residue collection*	2.0	1.0	1
Cooking**	198.0	112.8	86
Cleaning of utensils**	88.8	51.0	38
Water fetching (for household use and		1.98	-2
Mixing dung with water**		10.0	-10
<b>Total time saved</b>			<b>180 (3 hrs)</b>

Sources: \*East Consult, 2004; \*\*Dahal 2000, from Bajgain & Shakya, 2005, p 47

One of the key indicators of the success of the biogas program is client satisfaction, as measured by the annual user survey. A 2005 study by Bajgain and Shakya cited surveys conducted by Dahal in 2000 and East Consult in 2004 in which women users reported being satisfied with the biogas technology because there was less smoke, less work needed to keep the fire burning, less effort involved in cleaning the utensils due to the cleaner flame, and more time available for other activities, even while cooking.

With the saved time, women were able to engage in income-generating activities such as managing retail shops, growing vegetables for sale, and providing sewing services. In addition, they were able to pursue educational, religious, social, and leisure activities. As biogas can be also used for lighting, it allows women to work or study in the evenings, and thereby potentially increases their incomes.

The reduction of women's workloads through improved energy services opens up more opportunities for women to earn additional income. Their increased economic contributions to the family, along with the cleaner kitchen conditions associated with the use of biogas, has in some cases led male members of the family to share in household chores. Yet the introduction of biogas systems does not necessarily alter entrenched traditional patterns in the divisions of labor in rural Nepal (Bajgain & Shakya, 2005).

In connection with Phase IV of the program, BSP recognized the need to pay more attention to the inclusion of women, especially in leadership roles. Very few of the commercial biogas companies were owned by women, and there were not many female social mobilizers/promoters within the biogas companies. Efforts were made to ensure that the program's subsidy promotion and marketing would target more women. In terms of training and employment of women, there were only eight women masons out of 3000, 110 out of 800 supervisors, and 14 out of 700 skilled after-sales service technicians (Tamraker, 2007).

Following the 2009 ENERGIA-led gender assessment, the program revised the format of the annual user survey to collect gender differentiated data. With more attention to inclusion of women in the program, women become more involved in ownership, leadership, and skilled employment, as well as in community credit cooperation groups for financing biogas systems.

An analysis of the results of gender mainstreaming in the Nepal program indicated that by 2011:

- women owned 23 percent of biogas systems;
- thirty percent of cooperatives organized for financing biogas systems were headed by women;
- there were nine female-headed biogas construction companies; and
- twenty-three women technicians had been trained and were providing after-sales services



(Shakya, 2011).

*Photo: Women workers in the Nepal Biogas Program.*

*(Source: BSP-Nepal)*

## Recommendations for improving the effectiveness of biogas programs by greater inclusion of women

Understanding socioeconomic considerations related to the acceptance of the systems by women was seen as important to the success of the program, particularly as women can play an important role in acceptance of the biogas systems by convincing others that it is a good investment – or not.

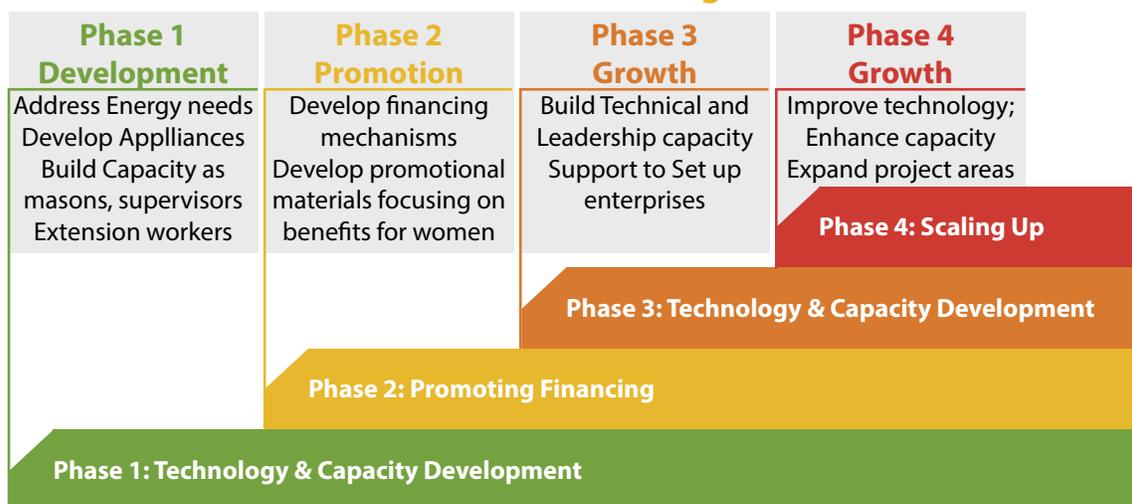
While more women are now involved in biogas construction, financing, and services, there is considerable room for growth in achieving greater gender equality in the sector.

### Improvements can be made in all aspects of a biogas program through:

1. Promotion: activities, agents, and materials that specifically target both male and female users.
2. Training: provided at times and locations appropriate to the needs and schedules of women, and in ways that build women's confidence to become biogas plant managers, masons and supervisors.
3. Extension services: using female agents to reach female users and inform them about applying bio-slurry as fertilizer for gardens, and the potential for selling it for income.
4. Finance: exploring alternative means of finance (e.g., through local institutions, self-help groups, use of group collateral) to enable women to access financial facilities easily.
5. Research and development: involving women in product design and field testing of new designs (ENERGIA, 2012b).

There are still significant constraints affecting the inclusion of women in various aspects of the biogas program, including social resistance to women serving as leaders in the sector, low acceptance of women as technical workers, and women's limited access to financial resources (Shakya, 2011). However, adoption and implementation of a gender mainstreaming plan with specific targets and indicators helps to focus more attention on ways to promote and measure the engagement of women.

### Gender Activities In Each Phase Of The Program



(Shakya, 2011)

## Examples of quantitative indicators for biogas programs

Expected outcomes	Examples of requirements/targets
Reaching women through biogas program	<ul style="list-style-type: none"> <li>■ X percent of women in users' training</li> <li>■ X percent of biogas plant owners are women</li> </ul>
Engaging women in supply side functions in a biogas program	<ul style="list-style-type: none"> <li>■ Private companies with women-friendly hiring and employment policies in place</li> <li>■ X percent of masons are women</li> <li>■ Women represent at least 50 percent of staff in national biogas development program</li> <li>■ At least 50 percent of promoters are women</li> </ul>
Increasing women's incomes	<ul style="list-style-type: none"> <li>■ X number of women and men linked with other existing opportunities that enhance women's welfare, income, or benefits</li> <li>■ X number of women and men receive training in enterprise services</li> </ul>

(ENERGIA, 2012b)

## B. A GENDER ASSESSMENT AND ACTION PLAN STRENGTHENED THE MALI RURAL ELECTRIFICATION PROJECT AND INFLUENCED NATIONAL PLANS FOR USE OF CLIMATE INVESTMENT FUNDS

### Project overview

The government of Mali, with support from the World Bank, initiated the Household Energy and Universal Rural Access (HEURA) project in 2003 to expand access to energy services in the rural areas and relieve pressures on woodlands. At that time, barely one percent of the rural population had electricity, and most of Mali's energy was supplied by biomass fuels, primarily wood and charcoal (Mali, 2004). Mali's overall objective was to reduce poverty and promote economic growth to meet the Millennium Development Goals. However, the project also received Global Environment Facility funds, as it was in line with the GEF objective of removing barriers to the adoption of renewable energy technologies in order to reduce greenhouse gas emissions.

The government recognized that there were significant technical and financial barriers affecting the marketing and distribution of renewable energy technologies in areas beyond the reach of the electrical grid. The project therefore established two new institutions that were charged with removing these barriers, supporting decentralized energy service companies, and attracting investors. These institutions were a rural energy services agency called the *Malian Agency for Domestic Energy and Rural Electrification (AMADER)* and a rural energy fund. In order to promote economic growth, the project aimed to provide electricity to support small enterprises and increase employment opportunities. Between 2003-2012, over 80 sub-projects were implemented by 83 operators, and more than 75,000 households and 1,300 institutions were provided with electricity (World Bank, 2013).

In 2011, the project undertook a gender assessment with support from the World Bank's African Renewable Energy Access Program (AFREA) and Energy Sector Management Assistance Program (ESMAP). There had previously been no specific focus on gender issues, even though collection and management of biomass fuels in rural areas was generally considered to be women's work, and some rural women spent up to a third of their time collecting wood (Cisse, 2007). Although about half of those expected to benefit from access to electricity were women, the monitoring mechanisms did not differentiate between men and women in evaluating the impacts of the project.

Household surveys taken as part of the gender assessment indicated that women made less use of the electricity for income generation than men, and that there was significant potential for increasing the economic benefits from the project by promoting more use of electricity in women's businesses. The gender assessment recommended measures to encourage more engagement of women in the electrification program, pointing out that identifying and meeting the different needs of men and women was not only an equity issue, but also a demand-side issue, and that incorporating gender considerations into the economic analysis made good business sense (AEI, 2012).

The gender assessment also recommended that AMADER prepare a gender and energy action plan designed to develop its institutional capacity to address gender issues. In connection with that plan, AMADER established a partnership with UN Women to develop ways of promoting income-generating enterprises for women using new energy resources and technologies.

In addition, an official gender focal point was appointed within AMADER with the responsibility of ensuring that gender equality was integrated into its projects. Subsequently, Mali adopted a national gender policy and introduced gender sensitive budgets (AEI, 2012).

In 2010, Mali was one of the countries selected to pilot a Scaled-Up Renewable Energy Program (SREP) investment plan, under the World Bank's Climate Investment Funds program. SREP activities are designed to promote economic growth through low-carbon development pathways.

As a result of the gender mainstreaming activities undertaken by AMADER under the HUERA project, the Mali SREP plan called attention to gender disparities as relates to access to energy and the ways in which such disparities can hold back development, particularly in rural areas. The plan called for strengthening gender-specific activities linked to productive energy uses, as was begun under the HUERA project, and creating employment for both men and women related to the adoption of renewable energy (Mali, 2011).

### **Achievements of Mali's rural electrification project**

Much of Mali is dry land vulnerable to droughts and depletion of natural resources, and these conditions are becoming worse due to the impacts of climate change. It is a poor country (in 2002, close to three-quarters of the population lived on less than a dollar) and the majority of the people are engaged in small-scale agriculture (Cisse, 2007).

The main fuel source is biomass, but the forests are becoming degraded and there is not enough wood to meet growing energy needs. In any event, traditional biomass cannot support the country's plans for expanded electricity generation to spur economic growth and social development. Alternative, sustainable, and affordable energy sources are needed to boost employment and also protect the environment.

Mali has a very low population density, with widely dispersed villages, and the main electricity grid does not even reach all the major cities. Therefore the government of Mali decided to embark on a parallel on-grid and off-grid energy access expansion approach in order to achieve the rural electrification goals set out

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in its National Energy Policy. It created the new rural energy services agency AMADER to support energy delivery enterprises by private companies, as well as local initiatives organized by communities and women's associations. It also set up a Rural Electrification Fund to provide targeted subsidies for upfront capital investment costs and provide guarantees and credit lines for rural electrification (Mali, 2011).

The overall objectives of the HUERA project were to:

1. Accelerate the use of modern energy in rural and peri-urban areas to increase productivity of small and medium enterprises, enhance the quality and efficiency of health and education centers, and to improve living standards;
2. Promote community-based woodland management to reduce unsustainable pressure on forest resources while simultaneously encouraging inter-fuel substitution and energy efficiency initiatives; and
3. Strengthen energy sector reform processes and related institutions to create a favorable investment environment for increased private sector participation in decentralized energy services delivery in rural and peri-urban areas (AFTEG, 2003).

As a result of the electrification plan, Mali's rural energy access rate increased from one percent in 2000 to 17 percent in 2012. In addition, the project also created 735 permanent and 1,689 temporary jobs. Some of these occupations included welding workshops, ice making shops, tailoring workshops, bakery and other food processing, Internet cafes, and telephone charging stations. The project also contributed to an increase in working hours for existing businesses (World Bank, 2013).

Following up on the rural electrification plan, Mali is using SREP funds to scale up the use of key renewable energy technologies, such as solar PV, mini-hydro, and biofuel technologies, with a focus on electricity production and productive energy uses.

### **Climate mitigation plans and renewable energy**

Although Mali has made voluntary commitments to reduce its greenhouse gas emissions, the country currently does not produce large amounts of greenhouse gas emissions due to its low levels of economic development, electricity production, and motor vehicle use. Most of its emissions are produced from widespread burning of wood and charcoal. The country's overall use of solar, hydro, and wind technologies for electricity generation is still low, but there is considerable potential for increasing the adoption of renewable energy technologies to support an economic development path that is low-carbon.

Mali was chosen as one of six pilot countries for the Scaling Up Renewable Energy in Low-Income Countries Program (SREP) established under the World Bank's Climate Investment Funds in part because the government had already embarked on an effective rural electrification project that supported an expansion of renewable energy. The main objective of the SREP program is to demonstrate the economic, social, and environmental viability of a low-carbon development path by increasing energy access using renewable energy and creating new economic opportunities.

Mali's SREP investment plan supports new projects as well as the scaling up of past projects, such as the rural electrification activities under the HEURA plan through which adoption of small-scale renewable energy technologies, such as solar home systems, allowed for delivery of electricity and increased business and employment without increasing greenhouse gas emissions (Mali, 2011).

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The government of Mali has set specific objectives to achieve a rural electrification rate of 55 percent, and a 10 percent contribution of renewable energy to the country's energy mix by 2015. The country's SREP activities are expected to:

- Contribute to a gradual transition from fossil fuel-based electricity generation and ineffective use of biomass, and encourage private investments to significantly increase the share of renewable sources in national energy generation.
- Reduce pressures on sustainable natural resources, notably forest resources, through synergies with other projects and programs geared towards energy efficiency.
- Enhance, in an integrated way, energy security, and business start-ups, as well as work towards a reduction of local pollution, and improvement in the livelihoods and living conditions of the local communities (with special attention to vulnerable groups, including women and young people) (Mali, 2011).

Feasibility and impact assessment studies for the efficient preparation, control, and technical monitoring of SREP investments will include analyses of the impacts of proposed investments on the condition of women and gender equity, and evaluation of the local degree of satisfaction in relation to the provision of energy services by public and private operators (Mali, 2011).

## Gender mainstreaming

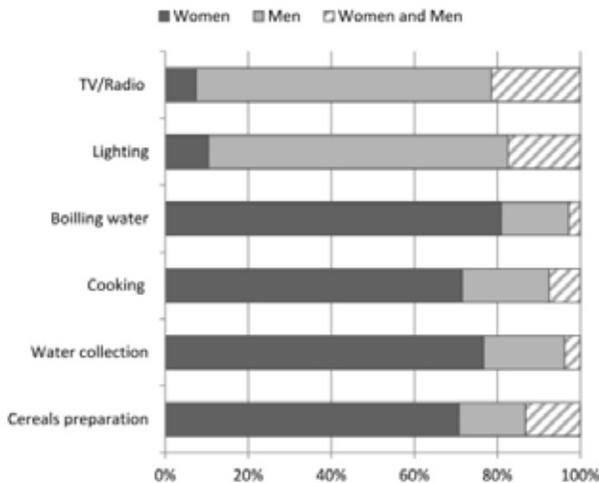
The gender assessment of the HEURA project was supported by the World Bank's Energy Sector Management Assistance Program (ESMAP) and the African Renewable Energy Access Program (AFREA). AFREA was established in 2010 to assist countries in meeting their energy needs and providing energy access using a gender sensitive approach and methodology (AFREA, 2012).

The gender assessment was conducted through a desk review, field visits, and consultations in 12 localities with local communities that were involved in the project. Two hundred household surveys were collected that covered issues of access to energy, household activities, and control of these services among women and men (AMADER, 2011).

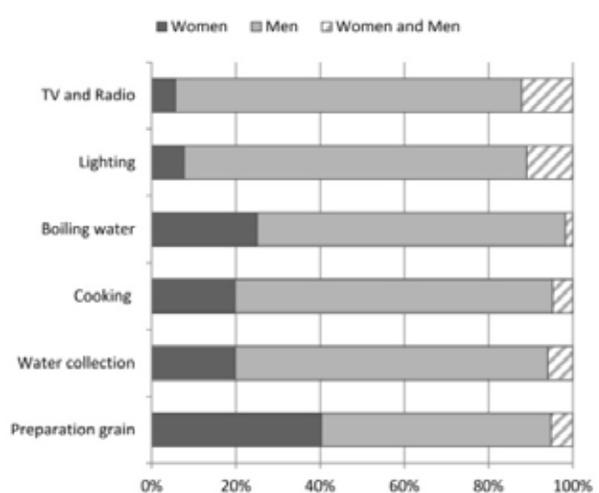
The gender assessment found that there were some women with access to electricity who engaged in small businesses such as managing sewing shops, beauty parlors, restaurants, or selling chilled drinks or ice using new refrigerators. In addition, members of women's associations were able to earn income by managing multifunctional platform systems to provide energy services in remote areas. However, fewer women than men made use of access to electricity for enterprise development (AEI, 2012).

# SAMPLE SURVEY DATA

Who **DECIDES** the type of energy required for ...?



Who **PAYS** for the energy needed for...?



WB Multi-topic Household Survey modified by AFREA to collect data related to gender issues in rural energy. Survey data from 195 respondents in 12 localities between July and August 2011.

(AMADER, 2011)

Some of the barriers and challenges identified as affecting women's use of electricity for productive uses included:

- limited number of overall business enterprises owned/managed by women;
- few women in decision-making posts;
- limited access to credit, information, and financial training;
- projects focusing more on technologies than on women's needs; and
- low level of training/engagement in operation and maintenance. (AMADER, 2011)

The gender assessment recommended that HEURA take action to encourage more direct participation of women in electrification programs, which included making sure that both women and men were involved in the design and implementation of projects and had access to technologies and credit facilities.

In addition, the gender assessment recommended that a gender and energy action plan for AMADER be prepared, with the engagement of project staff and management. The main objective of this action plan was to develop the institutional capacity of AMADER with regard to gender issues in the AMADER. Following preparation of the plan, a gender focal point was officially appointed with the responsibility to ensure that gender equality is integrated into future projects. As a result of the appointment of the gender focal point, a national gender policy was established and gender sensitive budgets were introduced (AEI, 2012).

# PROCESS FOR GENDER ASSESSMENT AND HEURA/AMADER GENDER ACTION PLAN

## Stage 1: Gender and Energy Assessment

- Desk review
- Consideration of successful examples of productive uses of energy and gender integration
- Field visits (12 sites in three regions of Mali)
- Collection of baseline disaggregated data on energy access and use (200 households)
- Inventory of effective practices and technologies that aid in the removal of barriers
- Nomination of gender focal points in villages for follow-up activities
- Review of project monitoring and evaluation framework
- Identification of AMADER capacity and training needs
- Documentation of findings and sharing information
- AMADER validation/sensitization workshop

## Stage 2: Gender action plan development and piloting of demonstration sites

- Action plan steering committee appointed
- Development of action plan based on information from gender assessment
- Gender focal point appointed within AMADER
- Pilot demonstrations in villages:
  - Selection of localities
  - Sensitization
  - Refinement of needs assessment
  - Implementation

(AMADER, 2011)

One woman surveyed reported that access to electricity improved her hairdressing business by:

- lengthening working hours at night;
- allowing her to provide more
- services in her home, e.g., using a styling iron and hair dryer;
- improving the comfort of customers
- by having a radio/TV, fan, and lighting;
- tripling the amount of sales; and
- providing capital to diversify
- activities and products.

(AMADER, 2011)



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In order to further expand the productive uses of energy, AMADER developed a partnership with UN Women and the World Bank to promote income-generating activities that are aided by access to energy and technologies and to increase the accessibility of equipment tailored to meet the needs of women and men (World Bank, 2013).

Starting in two pilot communities, this joint project called for a gender needs assessment, followed by an action plan in each community that will focus on:

- strengthening the technical skills involved in maintenance and repair among a pool of peer educators (men and women) in each village;
- training the peer educators to demonstrate to their communities the productive uses of energy sources and the risks of pollution from combustion;
- undertaking repairs needed for effective use of existing equipment and/or providing new energy equipment and processing units tailored to the needs of women and men; and
- promoting income-generating activities for women taking advantage of these energy sources and technologies.

Women will also receive training and assistance in developing business plans tailored to productive uses of energy, as well as marketing and production strategies, and access to funding sources. A community peer educator has been appointed in each community to oversee the implementation of the action plan and engage with partners locally (UN Women, 2012).

## Conclusions/Recommendations

The HEURA project is recognized as a best practice in different parts of Africa. At the close of the project in 2012, the World Bank evaluation indicated that it had met and even exceeded most of its targets. Among the different GEF-supported projects that were assessed by the GEF, the HEURA project was considered as a best practice, as it promoted the participation of women in activities that contributed to social and economic development in communities (GEF, 2013).

Going forward, it is important to involve women from the initial stages of projects expected to reduce emissions and promote economic development, as their success is linked to public acceptance of the projects and its usefulness to community members, including women.

The learning-by-doing process for mainstreaming gender in the project that was supported by the Africa Renewable Energy Access Program illustrates useful steps that can be replicated in Mali and in other countries. In addition, the pilot projects being undertaken in collaboration with UN Women will result in more attention to gender mainstreaming in this context.

It is particularly important that the mainstreaming efforts adopted by AMADER in the HEURA project were subsequently carried over into the preparation of Mali's Scaling-Up Renewable Energy Program (SREP) investment plan. By taking lessons from the HEURA, the SREP included specific support for income-generating activities that are particularly attractive to women, and the SREP is expected to therefore contribute both to climate mitigation as well as the social and economic status of women—by improving their access to energy for small enterprises, including food processing, retail shops, and restaurants (Mali, 2011).



(AMADER, 2011)

## C. EXAMINATION OF GENDER CONSIDERATIONS TO IMPROVE RIDERSHIP IN THE BOGOTÁ, COLOMBIA, PUBLIC TRANSIT SYSTEM

### Project overview

The TransMilenio rapid transit system serving Bogotá, the capital of Colombia, consists of interconnected bus lines with dedicated lanes for large-scale buses, and elevated stations designed for fast, efficient entry



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and exit of passengers. The system opened in 2000, and has gradually added additional bus lines. The primary goal of this project was to relieve traffic congestion in the city and provide fast and reliable transportation in order to support economic development and increase the city's competitiveness. Before the TransMilenio project, Bogotá's mass transit consisted of thousands of independently operated and uncoordinated mini-buses. Traffic congestion in the city led to a lengthy average commute, high levels of air pollution, and frequent accidents (UNDP, 2012).

Improving the city's transport system also lowered greenhouse gas emissions, due to greater efficiency in transporting passengers and reduced use of private vehicles. After successfully completing its initial phase, in 2006, the project was registered as the first transport project under the Clean Development Mechanism (UNFCCC, 2012).

It was expected that both men and women would be served by the improved transport system and be able to take advantage of increased employment options due to the fast and affordable service. In addition, establishment of the system has alone created direct and indirect job opportunities supporting social and economic development; with women making up about 24 percent of the total system workforce (UNDP, 2013).

There was some specific attention given to gender differences in trying to attract riders to the new transit system: certain seats were designated for women with children, and there were separate entry doors for pregnant women and other vulnerable riders (UNFCCC, 2010b). But in some locations, women were concerned about their safety traveling to and from the stations, as they had to walk longer distances than they previously had in order to access the mini-buses. In addition, as the system became heavily utilized, incidents of women being subjected to sexual harassment in crowded stations and buses increased (Betancourt, 2010). In 2009, UNIFEM launched a campaign to promote women's safety on the TransMilenio system (UNIFEM, 2009).

A few years later, as part of UN Women, it subsequently recommended a number of strategies to address women's concerns, including: bus routes that cater to women's schedules and the places they travel to; implementation of 'request stop' programs that allow women to get off closer to their destinations late at night and early in the morning; subway station design features that prioritize the prevention of violence; and well-lit access sidewalks and pathways equipped with emergency services (UN Women, 2013).

Since this rapid transit system is being considered as a good model for replication in other cities, for economic and social development as well as environmental reasons, it is important to highlight the ways in which greater attention to gender differentiated safety considerations can help maximize results in terms of attractiveness to riders and use of the system.

## **Benefits of creating a rapid transit system for Bogotá**

Bogotá has over 7 million people, and like many other capital cities, has faced challenges in meeting the transportation needs of its growing population. Effective mass transport systems are key elements for sustainable urban development, with significant implications for economic growth, social progress, and environmental protection. They can also contribute substantially to reductions in global greenhouse gas emissions.

In Bogotá, a transit system relying on private cars, inefficient private bus lines, and informal mini-buses led to high levels of local air pollution and CO<sub>2</sub> emissions, as well as traffic congestion, slow transit speeds, noise pollution, risky driving, and high accident rates (UNDP, 2012). After recognizing that the city could not afford the expense and time involved in building a subway system, the decision was made to begin establishing a

Bus Rapid Transit system, with new larger-capacity buses, dedicated traffic lanes, and a series of elevated bus stations.

The TransMilenio system is a public-private partnership; the city is responsible for building the new stations, bus lanes and terminals, while private companies invest in the large-scale and fuel-efficient buses, compete for concessions, and manage the operations. Passengers can buy tickets before boarding, and enter and exit quickly through multiple doors along the station. There are also scheduled arrival and departure times, and a centralized control and monitoring system (UNFCCC, 2012).

In areas where the system operates, it is estimated to have saved up to 40 minutes in travel time per trip, lowered noise levels by 3-10 decibels, reduced traffic accidents by approximately 50 percent, and generated substantial savings in health care costs due to decreased exposure to air pollutants, especially particulates, nitrogen, and sulphur oxides (WHO, 2011).

In addition, the TransMilenio system has supported new employment opportunities and economic and social benefits, and helped improve the overall quality of life for city residents (UNFCCC, 2012). Passengers now save an average of 223 hours annually that can be allocated for other productive activities (UNDP, 2010). The project had generated close to 40,000 direct and 55,000 indirect jobs by 2009 (UNECE, 2010). The system has also aimed at balancing the traditional dominance of men in the transport workforce, and prioritized the employment of groups such as single mothers. Women make up 24 percent of the total system workforce—62 percent of them single mothers—while in activities such as fare collection and bus washing, the participation of women reaches 70 percent and 43 percent, respectively (UNECE, 2010).

### Climate mitigation aspects of the project

In 2006, the TransMilenio mass transit system was registered as the first transportation Clean Development Mechanism (CDM) project, with an operational life of 21 years (UNFCCC, 2012). A key way in which the project reduces greenhouse gas emissions is by providing an attractive alternative to travel by private cars, thereby lowering per capita emissions, and by using more fuel efficient buses. Indirectly, TransMilenio can also reduce greenhouse gas emissions from other vehicles driving in the service areas due to improved traffic conditions.

A 2010 study indicated that out of 460 million passenger trips, 37 million would have previously been made using cars or taxis, 12.5 million would have been made by walking, 410 million would have been made using the old buses, and the remainder would not have been made without the new transport system (UNFCCC, 2010b).

From 2001 to 2008, the project reduced CO<sub>2</sub> emissions by over 1.6 million tons (WHO, 2011). Starting from 2012, the project was expected to reduce emissions by almost 250,000 tons per year with an expected total of over 5 million tons of CO<sub>2</sub> equivalent by the end of the operating period (UNFCCC, 2010b).

### Emission reductions are achieved by the following measures:

- Renewal of the bus fleet: TransMilenio uses new buses with state-of-the-art technology to replace buses that are, on average, 15 years old. The new buses have an improved fuel efficiency and lower emissions.
- Increased capacity of buses: TransMilenio uses larger units with a capacity of 160 passengers per bus on trunk routes. Conventional buses are much smaller and so, emissions per passenger are reduced.
- Improved operating conditions for buses: Confined, segregated bus lanes together with bus-priority

traffic signals allow buses on the route to operate more efficiently and without interference from other traffic, thus reducing fuel consumption and greenhouse gas emissions.

- Centralized bus-fleet control: This allows for a coordinated scheduling of bus services that adjusts bus frequency to meet demand. The load factor of buses is thus optimized, leading to lower emissions per passenger transported.
- Mode shift: The TransMilenio system is attractive to riders, thus inducing a switch from high-emission transport modes such as passenger cars or taxis to a low-emission transport mode. The increased attractiveness of the system is based on being faster, more reliable, safer, and more convenient.
- Introduction of fare pre-payment technology: This streamlines the boarding process and reduces emissions from idling buses.

(UNFCCC, 2012)

The income from selling Certified Emission Reduction Credits is expected to be between five and 33 million USD for the first crediting period, with significantly more anticipated later due to continuing expansion of the system (UNFCCC 2012). This can cover a substantial part of the financing needed for building the additional infrastructure needed to expand the system.

<b>Estimate of Income through the Sale of CERs (low, medium, high price scenario)*</b>			
	<b>USD 3/tCO<sub>2eq</sub></b>	<b>USD 10/tCO<sub>2eq</sub></b>	<b>USD 19/tCO<sub>2eq</sub></b>
<b>Projected Total CERs first crediting period</b>	1,726,000	1,726,000	1,726,000
<b>Expected Income in USD first crediting period</b>	5,200,000	17,300,000	32,800,000

\* Rounded reduction tons; Prices based on the NSS Colombia, 2000  
Source: UNFCCC, 2012f

### Improving the system by greater attention to gender considerations

In order to maximize the use, profitability, efficiency, and emission reductions of mass transport systems, they need to be designed to take into account the concerns of both women and men (GTZ-7a, 2007). Women and men have somewhat different transportation needs and concerns, and are not affected in exactly the same ways by the introduction of mass transit systems. For example, men may actually benefit more than women from less congestion and improved traffic safety, as they are more often the ones driving cars and involved in accidents; the WHO has reported that, globally, 73 percent of traffic accidents involve men and only 27 percent involve women (WHO, 2010).

Since few women in developing countries own cars or can afford taxis, mass transit systems that are fast, affordable, and reliable offer considerable benefits to women in terms of access to employment, education, and social services (UNECE, 2009).

The TransMilenio system's dedicated seats for women traveling with children and separate entry doors for pregnant women and other vulnerable riders indicate that some consideration was given to the safety and comfort of women riders. There are also station attendants who can assist passengers, which provides some degree of security.

However, women's safety remains an important concern. UN Women has called attention to the fact that in Bogotá, more women than men are victims of robberies in the early morning and late at night, including on principal routes of the TransMilenio system (UN Women, 2013). Fewer women have full-time jobs, and women may need to make more stops and varied types of trips at different times than men due to their caretaking responsibilities; men are more often traveling directly to and from employment centers at peak times (Betancourt, 2010).

UN Women has found that women's safety can be improved by implementing the following steps: bus routes and schedules give more consideration to the times and places women are likely to travel; the ability of bus passengers to request unscheduled stops closer to their homes at off-peak times; and ensuring areas around bus stations are well-lit and provide access to emergency assistance (UN Women, 2013).

Similarly, a World Bank-sponsored guide for inclusive bus rapid transit systems noted that although these systems could provide important benefits, women might be reluctant to use them: "Women may fear to use public transport out of fear of being molested or becoming victims of rape. Deserted streets, a lack of 'ownership' of public space by residents, poor lighting at night, and a lack of public space for local residents to gather may all contribute to this situation." Some of the suggestions offered to address these problems included: efforts by public officials and media to promote a culture of safety and security; coordinated plans to address crime; public education campaigns; and organization of neighborhood organizations (Rickert, 2010).

Sexual harassment in crowded stations and buses has been cited as a major factor affecting women's willingness to use the system (Betancourt, 2010). UNIFEM took its campaign on 'Cities Without Violence against Women: Safe Cities for All' to Bogotá in 2009, using theater performances and messages on posters and electronic billboards to dramatize the experiences by women passengers. Harassment of women is common on public transportation systems in Latin American cities, and UNIFEM suggested that Bogotá should address the problem by designating women-only areas (UNIFEM, 2009).

## Conclusion/recommendations



The BRT system of TransMilenio is considered a model for a modern mass urban transit systems, and is being replicated by a number of cities in Chile, Ecuador, Peru, Panama and Brazil (UNFCCC, 2012).

As other cities look to the CDM to finance their transit systems, there is an opportunity to identify and implement measures that will maximize ridership satisfaction by addressing women's concerns about safety and freedom from harassment.

Public officials, investors, and other stakeholders need to be made aware of the practical, financial, and environmental benefits inherent in paying attention to women's interests, as well as the social benefits of more inclusive processes and decision-making.

(Source: <http://bananaskinflipflops.com/2011/04/13/please-dont-molest-me-on-transmilenio/>)

### III. LESSONS FROM PROJECTS AND RESOURCES REVIEWED

**Gender mainstreaming throughout the project is essential to project success – results are most effective when gender issues are integrated from the outset.**

So far there have been few climate mitigation projects that have applied gender mainstreaming from the beginning. That will hopefully change going forward, and we will see gender differentiation addressed in the goals, objectives, expected outcomes, monitoring, and evaluation of new projects. In Bogotá, Colombia, for example, while there was some consideration of the different needs of men and women riders, identification of women and men as distinct target groups could have led to deeper analysis of differences in the types of trips men and women make and the specific safety concerns of women riders. In the Nepal projects, although women were viewed as primary beneficiaries, it was only after gender assessments were conducted that there was emphasis placed on training to engage women in the construction and management of the systems.

- To ensure that gender-related statements in project proposals actually lead to specific operational activities, it helps to develop a gender action plan that covers:
- agreement on how the project can be improved by attention to gender equality;
- adoption of gender sensitive goals, supported by specific outcomes and activities;
- participation of intended beneficiaries, including women, in design and
- implementation; and
- tracking of gender differentiated results through monitoring and evaluation.



(ENERGIA, 2012a)

**Socially disaggregated data – intentionally gathered throughout the project cycle – supports more effective projects: systematic gender-focused data collection, targets, and indicators help to properly analyze and demonstrate the impacts of attention to gender equality in climate change mitigation.**

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Much more research and analysis is needed in order to be able to document methods through which attention to gender equality can improve the overall effectiveness and long-term sustainability of climate change mitigation activities.

One of most important gaps is the lack of gender differentiated data regarding public participation in and contributions to climate change mitigation projects, and the economic and social benefits of those projects. Few of the projects already implemented began with baseline surveys or assessments of social and economic conditions, including gender roles, responsibilities, and requirements. Therefore, even where data became available later on, it was difficult to make useful comparisons and evaluations.

The development of gender plans from the outset, together with establishment of related targets and indicators, will facilitate the collection of information needed to more fully evaluate and analyze the impacts of integrating gender and including women. There are many tools, guidance materials – and gender experts – able to provide assistance in this work, and help ensure that the goals of gender equality and climate change mitigation become mutually reinforcing.

**Economic and social co-benefits, for both men and women, help secure national and community support for activities that contribute to climate change mitigation, and ensure their long-term viability.**

Governments and communities within developing countries are concerned about the national and local economic and social impacts of climate-related programs and investments as much, or perhaps more so, than global greenhouse gas emission levels. As the success of some climate change mitigation measures depends in large part on the acceptance and use of new products and infrastructure facilities, analysis of what benefits might emerge for both men and women as a result of a particular project can be a critical factor in its success or failure.

This may require a shift in focus for financial and technical experts who look mainly at hard numbers such as expected emission reduction levels, or return rates on investments, without taking into account ‘soft’ factors, such as cultural preferences and gender roles.

Standards could be put in place to help project developers understand how a mitigation project might have positive co-benefits and impacts in particular areas, including factors such as women’s increased income/assets, shifts in time use, access to education and knowledge, political empowerment, increased food security, and health.

**Integration of gender equality issues affects project efficacy and impact, e.g.. by improving the results of large-scale transport and grid-based energy infrastructure projects, as well as small-scale, off-grid initiatives.**

Since women are the ones responsible for managing most aspects of domestic energy use in developing countries, especially in rural areas, it is clearly important to involve them in household and community-level energy and climate-related programs during all phases of programming. Attention to gender differences can result in increased sales and productive uses of improved stoves, home solar systems, and other low-carbon technologies. For cooking programs, such as the biogas initiative in Nepal, women are definitely the principal users. The success and long-term sustainability of these programs will depend on women’s views on cooking ease, affordability and access to financing, labor involved in adopting and maintaining the system, and cultural acceptance of the fuel source.

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Women also represent a large portion of the target users for electricity and transportation infrastructure projects. For bus rapid transport systems, like the one established in Bogotá, women's safety and convenience should be a factor taken into account from the beginning in order to maximize ridership acceptance and use of public transportation. In electrification projects as well, there may be special factors affecting women – for example, constraints limiting their ability to purchase equipment or connect to the grid – that could be addressed by targeted financing, market outreach, and technical support that can lead to higher overall rates of usage.

**Gender sensitive government and institutional policies are key factors in the formulation of more inclusive climate change mitigation measures and investments.**

In Mali, for example, the attention to gender mainstreaming in the HEURA project in 2011 was influenced by the government's adoption of a national gender policy in 2010, and by the Gender and Energy Program initiated in 2010 by the World Bank's Africa Renewable Energy Access Program (AFREA), which is dedicated to integrating gender considerations into the policies of rural energy agencies in the region.

For the UNDP/GEF Small Grants Programme (SGP), which primarily focuses on small-scale, local, community-based projects, attention to gender is one of the main criteria for approval. SGP National Steering Committees use checklists and criteria to assess projects with regard to how they address gender issues, and some countries apply their own gender mainstreaming guidelines. A needs assessment is undertaken at the project development phase and is used to define the roles of women and men in the implementation stage. Project evaluations document the differing contributions of women and men to the success of the activities, and this reinforces the integration of gender considerations in future projects.

As other organizations involved in financing larger-scale climate projects implement new gender policies and mandates, there will be more opportunities for examining, documenting, and replicating ways of improving climate mitigation project results through gender mainstreaming.

**Many governments, funders, and institutions need guidance on how to incorporate gender considerations in ways that lead to more effective and inclusive projects.**

Members of the ENERGIA network have provided guidance to the Nepal Biogas Support Program, as well as a similar program in Pakistan. In Nepal, this led to improved user surveys and the adoption of targets for involving more women in the use, construction, management, and ownership of biogas digester plants. In Pakistan, the managers of the program requested assistance from ENERGIA in designing a formal gender mainstreaming plan to help them achieve their goal of building a commercially viable biogas sector. In providing this type of assistance, ENERGIA applies a set of tools and methodologies the network has developed on gender mainstreaming, and enlists trainers from national network members.

AFREA's Gender and Energy Program was set up to support the practical integration of gender within energy projects through a learning-by-doing approach. This includes engaging in dialogues with energy practitioners, agencies, and policymakers, and working with rural energy agencies to identify local champions to introduce gender issues in project planning, undertake assessments to understand community needs and opportunities, and develop action plans. In Mali, the AFREA-led gender assessment of the rural energy institution AMADER resulted in the development of an action plan and later the appointment of a gender focal point for the institution to help formulate gender sensitive plans, policies, and budgets.

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The project was initiated by Sam Bickersteth, CEO of CDKN, along with Rachel Harris from WEDO and Nathalie Eddy from the GGCA Secretariat, who also oversaw the selection of the case studies and the preparation and production of the report.

The ENERGIA International Network on Gender and Sustainable Energy was contracted to manage the research, consultations, and document production. Gail Karlsson, ENERGIA Senior Policy Advisor was the lead author of this report. Ana Rojas Blanco, ENERGIA Gender and Climate Specialist managed the case selection workshop and report. WEDO intern and Columbia University graduate student Mahlet Eyassu Melkie prepared first drafts of the case studies.

To identify relevant case studies, the GGCA Secretariat and WEDO conducted a baseline literature review of the current available studies that cover the integration of gender equality within climate mitigation projects. The literature review revealed the limitations of the current research on this particular subject and made the case that further empirical research needs to be done with a focus on gender equality and climate financing for mitigation. ENERGIA also conducted its own review of existing mitigation projects financed by climate finance mechanisms that have included a gender equality component.

Overall guidelines for the case studies included:

1. Geographic balance to reflect a diversity of regional perspective
2. Thematic balance, with at least one case study of a mitigation intervention in the energy or transport sectors
3. Direct link to climate-related financing (e.g. CDM, GEF, voluntary carbon credits, REDD+)
4. Availability of gender relevant data
5. Attention to gender promoting project effectiveness and sustainability, economic benefits to women

Based on an initial review of the relevant literature and a list of potential projects for case studies, the team convened a workshop on June 8 (during the meeting of the UNFCCC Subsidiary Bodies in Bonn, Germany) to discuss the research and projects with experts in the field. Experts met for three hours and were presented with the baseline literature review and a presentation of the eight case studies. Three studies were chosen as they fulfilled the criteria, sparked the interest of the experts, had regional balance, focused on areas of interest to the experts and had a comparability factor. There was consideration of a forestry project but it was not chosen due to its lack of comparability to the other projects. It was agreed that an overview section would present snapshots of other projects being considered. In addition to team members, the workshop participants included:

Gotelind Alber, Board Member, Gendercc; Elizabeth Eggerts, Climate Finance and Gender Specialist, UN Development Programme; Sandra Freitas, Climate Policy Analyst, Climate Analytics; Smita Nakhooda, Research Fellow, Climate Change, Environment & Forests, Overseas Development Institute; Cate Owren, Executive Director, WEDO; Leo Roberts, Project Manager, Negotiations Support, CDKN; Liane Schalatek, Associate Director, Heinrich Boell Foundation North America ; Kiran Sura, Head of Advocacy Fund, CDKN ; Vera Weill-Halle, Chairperson, Board of Directors, Women Organizing for Change in Agriculture (WOCAN)

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Time, capacity, and financial limitations did not allow for empirical research to be conducted on the projects selected. Information was collected primarily from written reports available online. During the review period, GGCA and WEDO requested reviewers from CDKN and others connected to projects/locations to provide missing resources or fill gaps in the research. While the case studies reveal robust and interesting findings even within these limitations, it is important to note that they merely provide a small window into what could be a larger study on the future of climate finance mitigation projects that mainstream gender.

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