

COMPENDIUM OF ABSTRACTS

Sharing Experiences of Gender and Renewable Energy Innovations

SARDC Virtual Conference
10-11 November 2021





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With funding from



**Austrian
Development
Cooperation**

Mainstreaming Gender in the SADC Renewable Energy Sector

This Compendium is produced by the Beyond Inequalities (BI) Gender Institute of the Southern African Research and Documentation Centre (SARDC) through a project on *Mainstreaming Gender in the SADC Renewable Energy Sector* funded by the Austrian Development Agency. The information is drawn from a conference hosted by SARDC BI on 10-11 November 2021 using related knowledge materials from this project. The compendium and related information are available on www.sardc.net Knowledge for Development. Responsibility for the content of this publication lies entirely with SARDC. The information and analysis do not reflect the official opinion of the Austrian Development Agency. *November 2021*

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Citation

SARDC, 2021. *Sharing of Experiences of Gender and Renewable Energy Innovations - Compendium of Abstracts*. SARDC, Harare.

This publication is produced by SARDC Beyond Inequalities Gender Institute with funding from the Austrian Development Agency (ADA). Responsibility for the content of this publication lies entirely with the publishers. The information and views expressed do not reflect the official opinion of ADA.

Access to affordable, reliable and modern energy is critical in addressing development challenges which include gender inequalities, where women are the most disadvantaged.

INTRODUCTION

The energy sector is one of the main drivers of economic development in the Southern African Development Community (SADC), as shown in the regional development plan for 2020-2030, the Regional Indicative Strategic Development Plan (RISDP). The plan places emphasis on energy as an important factor of regional integration and socio-economic development.

Gender equity and equality are a main area of focus in the integration agenda and SADC Member States have supported the fundamental principle that women and men must be engaged at all levels and in all areas of socio-economic development. The nexus between gender and energy therefore becomes imperative as both are important factors to the development of the region. Access to affordable, reliable and modern energy is critical in addressing development challenges which include gender inequalities, where women are the most disadvantaged.

Women are in most cases responsible for household chores and this occupies most of their time in collecting firewood for cooking, heating and lighting needs. Women and girls may travel long distances to carry water for drinking, cooking and other tasks which takes up a lot of time and can be a threat to their wellbeing. These duties can be lifted and the lives of women made easier through access to Renewable Energy Technologies (RETs) and other innovations.

In recognition of the challenges that befall women in particular, as a result of lack of access to renewable energy, the Southern African Research and Documentation (SARDC) through its Beyond Inequalities Gender Institute organized a conference which was aimed at providing a platform for stakeholders to share innovations in the renewable energy sector that advance gender equality. The conference brought together stakeholders in the renewable energy sector to discuss success stories, innovations, experiences, challenges, lessons learned and how to carry forward efforts at mainstreaming gender in renewable energy services.

We present in this report a compendium of abstracts of the presentations shared by various stakeholders during the conference held virtually on 10-11 November 2021.

Equality for women and men can be accelerated through sharing knowledge.

Conference Objective

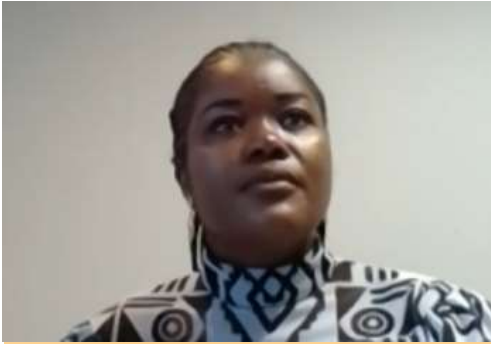
Equality for women and men can be accelerated through sharing knowledge and experiences that lead to adoption of innovative practices in the use of appropriate energy technologies.

Expected Results

⇒ Contribution to the reduction of gender inequality in the energy sector;

⇒ Strategic linkages with stakeholders are established to advance innovations; and effective practices; and

⇒ Recommendations for policies, practices, and research areas to advance the objective.



KEYNOTE ADDRESS AND OFFICIAL OPENING

BY HON DR NOBUHLE NKABANE

**DEPUTY MINISTER OF MINERAL RESOURCES
AND ENERGY OF SOUTH AFRICA**

The renewable energy sector also offers opportunities for women to participate in this sector as entrepreneurs, academics, board members and as executives.

The Honourable Minister began by noting that renewable energies offer diverse opportunities for the citizens of southern Africa, particularly marginalized groups such as women and girls and that these opportunities could only be accessible if there is equitable distribution and access to RE services for all.

Given the importance of the role that women play in the development of the renewable energy sector, we should all embrace this opportunity and contribute to the fullest for the benefit of our countries, the region and the continent as a whole.

According to the annual report by the International Renewable Energy Agency (IRENA) in 2019, renewables offer diverse opportunities along the value chain requiring different skills sets but these opportunities should be equally accessible and the benefits equitably distributed through the entire society. The report highlights that the renewable energy sector employs about 32 percent women as compared to 22 percent women employed in the energy sector overall.

The renewable energy sector also offers opportunities for women to participate in this sector as entrepreneurs, academics, board members and as executives. Women should also benefit economically from the emerging industry using new technologies.

Dr Nkabane said this conference on Sharing Experiences of Gender and Renewable Energy Innovations comes at the right time, when the world is discussing how to reduce carbon emissions to the required levels, at the United Nations Climate Change Conference (COP 26) in Glasgow, Scotland.

*...we have no time,
but to force our way
and be part of the
revolution, making
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anyone behind.*

She said that an energy transition that is grounded in renewable energy sources and technologies is the only way to meet the global goals of the UN Agenda for Sustainable Development and the Paris Agreement. She emphasised that gender and renewable energy discussions need to be interrogated more to achieve sustainable development.

Accelerating progress towards gender parity can also boost African economies by the equivalent of US\$316 billion or 10 percent of their collective Gross Domestic Product (GDP) by 2025.

The Deputy Minister reminded participants that energy is at the centre of economic development in South Africa, in the southern African region and the continent. The sector therefore requires policy support from Member States and regional institutions in order to fully explore its benefits and advantages for women and men.

She said that South Africa has put in place an investment facility for the renewable energy sector where women are encouraged to actively participate as entrepreneurs.

Dr Nkabane concluded by stressing that we have no time, but to force our way and be part of the revolution, making sure we do not leave anyone behind.



SARDC, as a regional knowledge resource centre, is ready to assist in working with various stakeholders to ensure targets for access to renewable energy are achieved and that gender is mainstreamed to ensure equality for sustainability.

WELCOME REMARKS

BY SARDC EXECUTIVE DIRECTOR

MUNETSI MADAKUFAMBA

The SARDC Executive Director welcomed the participants to the virtual conference on “Sharing Experiences of Gender and Renewable Energy Innovations”. He said the conference is intended to contribute to the advancement of gender equality through sharing knowledge and experiences that can lead to the adoption of innovative practices in the renewable energy sector. The conference is necessitated by the fact that lack of access to renewable energy affects women and men disproportionately.

Daily household chores such as collecting firewood for cooking, heating and other needs are done by women in most cases and occupy a significant amount of their time. Through improved access to modern clean energy services, both women and men can have time to engage in income-generating projects and can improve their health, status and living conditions.

He emphasised the critical role that the renewable energy sector plays in creating space and equal opportunities for women and men to reach their full potential and to contribute to sustainable development. It is thus important that stakeholders and citizens are encouraged, motivated and empowered to develop innovative ideas that can improve their wellbeing.

He called on participants to share practical innovations that can stimulate debate on areas that are yet to be explored in ensuring gender equality is achieved in the energy sector, as well as opportunities for replication across the region.

The Executive Director said that SARDC, as a regional knowledge resource centre, is ready to assist in working with various stakeholders to ensure targets for access to renewable energy are achieved and that gender is mainstreamed to ensure equality for sustainability.

Of a regional population of about 370 million people in the 16 countries of the Southern African Development Community (SADC), just over one-third has access to electricity. Women constitute more than half of the

...SADC Member States can be encouraged to create conditions that ensure gender mainstreaming in the renewable energy sector.

population of most SADC Member States but face disproportionate challenges associated with access to modern sources of energy compared to men. Access to energy is therefore gendered, with women in most countries in the region experiencing energy poverty differently and more severely than men.

This is partly due to the fact that in most SADC countries, women and girls are to a large extent responsible for household and family support activities, including energy provision. Most SADC countries, women and girls are to a large extent responsible for household and community activities, including energy provision.

To this end, the SADC region has made the political decision and commitment to mainstream gender and promote the empowerment of women in policies and development initiatives. However, what remains a challenge is the transition from political will to concrete actions due to a number of factors which include lack of capacity or enforceable legislation to mainstreaming gender. This is precisely what the project on “Mainstreaming Gender in Renewable Energy Sector” seeks to address through this conference.

Broadly, it is hoped that through this effort, the SADC Member States can be encouraged to create conditions that ensure gender mainstreaming in the renewable energy sector.

Promoting gender mainstreaming in renewable energies would contribute to advancing human development and achieving the Sustainable Development Goals (SDGs), to ensure that women are afforded opportunities to fulfil their potential and contribute to the economic development of the country, region and continent.



REMARKS

BY SACREEE EXECUTIVE DIRECTOR

KUDAKWASHE NDHLUKULA

The Executive Director of the SADC Centre for Renewable Energy and Energy Efficiency (SACREEE) outlined the role of the institution in promoting access to renewable energy.

SACREEE was established by the SADC Member States in 2015 to contribute to increasing access to modern energy services and improved energy security across the SADC region through the promotion of a market-based uptake of Renewable Energy (RE) and Energy Efficiency (EE) technologies and energy services.

He said that the issues to do with gender and RE are among the activities that the SACREEE is pursuing as women and girls are often the most vulnerable groups without access to renewable energy.

He said that women are more concentrated in the informal sector as compared to their male counterparts, and this imbalance is due to lack of financing and appropriate training in RE technology, lack of awareness and institutional support, as well as restrictive cultural and social norms that view energy-related businesses as work for men. The SACREEE business plan 2019-2023 covers gender mainstreaming in order to address these issues.

...gender and RE are among the activities that the SACREEE is pursuing as women and girls are often the most vulnerable groups without access to renewable energy.



...more than 95 percent of population in most EAC Partner States do not have access to clean cooking, with exception of Kenya.

REMARK

BY EACREEE EXECUTIVE DIRECTOR

GODDY MUHUMUZA

The East African Centre for Renewable Energy and Energy Efficiency (EACREEE) is a centre of excellence mandated by the East African Community (EAC) to advance renewable energy and energy efficiency. EACREEE's mandate is premised on five main themes with respect to renewable energy and energy efficiency: (i) regional policy harmonization; (ii) capacity building; (iii) research, development and innovation; (iv) knowledge management; and (v) investment promotion.

The EAC is home to about 169 million people of whom 50.4 percent are women and girls. About 78 percent of the population lives in rural areas. There is high dependence on biomass and low levels of electricity access in the EAC Partner States. Per capita consumption of electricity in the EAC is very low compared to Sub-Saharan Africa as a whole (480 kWh/capita/year). Grid electricity access is still limited to urban and peri-urban areas.

He said that more than 95 percent of population in most EAC Partner States do not have access to clean cooking, with exception of Kenya. Energy poverty affects the women and youth since they travel long distances and spend many hours to collect firewood for cooking. Access to renewable energy could support the women and youth to focus on other economic activities that can improve their income and dignity.

In September 2018, the EAC Secretariat launched the Gender Policy that seeks an inclusive community which guarantees equal rights and opportunities for women and men, boys and girls.

The policy further aims at strengthening the gender mainstreaming in planning and budgetary processes of all sectors in the EAC Organs, Institutions and Partner States. He said that EAC is ready to work with SADC in advancing access to RE for women and girls.



ABSTRACTS

PRODUCTIVE END USE OF ENERGY PROMOTES ECONOMIC EMPOWERMENT FOR WOMEN



...SNV works closely with the marginalised groups in various communities, mainly women and the youth.

Introduction

SNV Netherlands Development Organisation is a not-for-profit international development organisation that makes a lasting difference in the lives of people living in poverty by helping them raise incomes and access basic services. The SNV focus is on three sectors, with a long-term, local presence in about 24 countries in Asia, Africa and Latin America.

In the energy sector, SNV's work on biogas markets applies decades-long expertise to specific local market conditions. They have also established a track record in introducing improved cook-stoves and off-grid electricity solutions. The SNV approach is anchored in market research. Based on the organisation's local expertise and as appropriate, it combines demand creation, technical and business advice for entrepreneurs, with incentives to distribute quality products, support to government agencies to run market-based energy programmes, and advice to improve enabling environments.

SNV offers early-stage grants and results-based financing to help de-risk commercial investments and incentivise companies to engage in underserved areas. They also advocate for more funding for decentralised energy services, for the removal of regulatory barriers to make the energy sector more attractive to business investors and for national quality standards. In the energy sector, SNV works closely with the marginalised groups in various communities, mainly women and the youth.

Abstract

SNV Netherlands Development Organisation operates in three sectors of Agriculture; Energy; and Water, Sanitation, Hygiene (WASH). The main work in the Energy Sector is centred on the promotion of access to energy through use of clean and efficient technologies such as bio-digesters, clean cooking and heating, and off-grid electricity. While energy is a standalone sector, it is also considered as a key enabler to production in most if not all productive sectors.

Use of Biogas meant that women's wellbeing and health were addressed through the elimination of exposure to unhealthy fumes such as smoke from fire, and the time previously allocated to fetching firewood could be dedicated to more productive areas of their livelihoods.

SNV has been implementing projects in the Energy Sector and some key successes have been recorded from a number of projects that we have implemented:

1. Zimbabwe Domestic Biogas Project – The Biogas Project was a Pilot implemented to promote the use of Biogas as an alternative source of clean energy for cooking, heating and refrigeration. A total of 122 digesters were constructed during the life of the project with most being used primarily for cooking. The use of the digester was also extended for refrigeration for household purposes and also milk-chilling for households involved in Dairy.

While Biogas has many productive uses, cooking was used as an entry point for each household because of its numerous advantages to women. Use of Biogas meant that women's wellbeing and health were addressed through the elimination of exposure to unhealthy fumes such as smoke from fire, and the time previously allocated to fetching firewood could be dedicated to more productive areas of their livelihoods. In addition, the reduced use of firewood would help to protect the environment. The Biogas Project was operational from 2013 to 2015. During this period a number of Biogas Masons and Quality Controllers were trained for sustainability of the initiative and these have continued to be available for constructions.

2. Green Innovations Project – The Green Innovations as a component of GIHUB Phase II and III Project was implemented by SNV with support from the Embassy of Sweden through UNICEF. The main objective of this component was to facilitate more greening of the country as well as to see an increase in the number of Green Jobs in the private sector and in NGOs. The other objective was to contribute towards the creation of a gender-responsive, enabling legal framework for climate change adaptation and mitigation in Zimbabwe through the provision of a model for youth involvement. This project saw a total of 20 youth benefiting from grants worth USD 5,000 each after a careful selection process, with a deliberate effort to encourage young women participation. While the project promoted innovations in the Green Jobs sector a number of the projects were also considered under the Energy Sector.

One innovation developed to address the situation of women was the “Production of Briquettes from Recycled Materials”. The briquettes were produced using recycled

...young women have expressed interest in being solar sales agents because the opportunity allows the young women to attend to other household responsibilities while they also generate income.

farm waste, mostly dried maize cobs and recycled paper, while another innovation, the chick brooder would benefit directly from the innovations. The briquettes are multi-purpose and could be used for cooking or in cook-stoves or for the heating of poultry through the chick brooder. Chicken heating is critical for poultry production and usually the producers resort to inefficient sources of energy such as firewood and infrared lights. Poultry production is an industry that is generally dominated by women and such an innovation is expected to help in addressing energy needs.

3. Sustainable Energy for Rural Communities Project was implemented in Gwanda South with the main objective of increasing access to energy through Solar. The communities, particularly women were encouraged to start up Energy Kiosks. Energy kiosks were small businesses that were set up to provide a range of services such solar products sales, device charging, and battery rentals. While the project's main objective was to address access to energy, the women benefited from economic empowerment through these energy enterprises.

A number of products were introduced that were targeted for women with some being solar water pumps and solar fridges. Demand for these products increased as they also offered an opportunity for women to engage in self-empowerment projects such as agriculture production in their small gardens as well as catering businesses.

4. Currently SNV is implementing the Opportunities for Youth Employment Project (OYE) in Zimbabwe and Zambia that seeks to create employment for 10,000 youth in Zimbabwe. The target sectors are Energy, Agriculture and Green Jobs. To date young women have expressed interest in being solar sales agents because the opportunity allows the young women to attend to other household responsibilities while they also generate income. Innovations such as mobile solar water pumps will benefit young women immensely by enabling an easy way of fetching water and can also be used productively by offering a water pumping service to others.

ENERGY PLANNING AND MANAGEMENT FOR HUMAN DEVELOPMENT IN ZIMBABWE



The vision is to help to initiate inclusive and just societies where the rights of citizens are recognized and local institutions are empowered to drive their own development.

Introduction

The Civic Forum on Human Development (CFHD) is a network-based organization formed in 1995 with the core mandate to foster positive communication, dialogue and consensus-building involving civil society organizations and stakeholders for improved housing, service delivery and local economic development in rural and urban local authorities of Zimbabwe. The organisation later rebranded in 2012, to respond to demand for a human-development focus in helping to build strong communities, institutions and policy development processes to transform human development towards addressing the needs and priorities of vulnerable communities from the local to the national levels. The vision is to help to initiate inclusive and just societies where the rights of citizens are recognized and local institutions are empowered to drive their own development. They seek to achieve this through the transformation of the systems and processes that contribute positively to human development based on respect for people's participation, human rights, empowerment, service delivery and responsible policies.

Energy Planning and Management

Energy planning and management in Zimbabwe is defined at national level through the Ministry of Energy and Power Development using a top-to-bottom approach. The role of sub-national structures such as rural and urban local authorities has largely been insignificant and these have been the recipient of energy projects, plans and priorities approved at the national level. The energy generated from developed sites has been exported out of the communities that are the custodians of the surrounding physical environment without much direct benefit, and this has seen the rural energy poor remaining poor without adequate access to modern energy technologies.

This paper seeks to have a bottom-up approach in energy planning so that the rural energy poor may have improved livelihoods. This can be achieved through capacity

The local authorities need to address the issue of energy access as an equally important area like health, education and any other critical issues that are deemed necessary.

development of local structures and actors involved in local energy planning and management.

The launch of the national renewable energy policy in March 2020 provides opportunities and strategic avenues for the participation of previously excluded groups in energy planning and management at the district and community level. The local authorities need to address the issue of energy access as an equally important area like health, education and any other critical issues that are deemed necessary. Equipping local authorities together with other stakeholders such as traditional leaders, community-based organisations and civic society organisations with skills to develop renewable energy action plans is crucial if Zimbabwe is to achieve national targets in the National Development Strategy 1 and the Vision 2030.

CFHD has been working with four Rural District Councils in the development of participatory District Renewable Energy Action Plans (DREAPs). The DREAPs are an indicator of what is required to meet basic energy access for rural households. The DREAPs commit the local communities towards the protection of their physical environment particularly against deforestation. The energy management component focuses on working with women on how to efficiently use the energy they have, in this case the efficient use of firewood to help women reduce the time spent on fetching firewood and also reduce the number of trees that are harvested to get the firewood. Such initiatives include the use of energy-saving cook stoves and rocket barn tobacco-curing. The excessive use of firewood is causing environment damage and the effects have negative impacts on women and children.

Energy planning and management has been largely left for the individuals to find their own solutions and hence energy consumption in Zimbabwe is bringing negative impacts with uncertainty as to what people (especially women) would do in accessing energy. The inclusion of women in planning and management of energy is very important in advancing gender equality. Rural societies have a number of specific characteristics which do not apply to urban societies and hence the need to develop energy-planning and management solutions that are also specific to rural needs.

BIOMASS PELLETS AS A CLEAN ENERGY SOLUTION



Introduction

Basanta Gautam has been working as the Project Manager at Arbonaut Ltd. in Helsinki, Finland since 2008. His fields of interest focus on climate change, forestry and nature-based solutions using state-of-the-art technologies. Mr. Gautam has climate change and renewable energy experience Uganda, Nigeria, Nepal etc.

Biomass Pellet Industry: A clean energy solution for Nepal

Nepal is one of the most vulnerable countries in terms of climate risk. The concept by Arbonaut aims at reducing greenhouse gas emissions of Nepal and creating employment, revenues, good health and wellbeing, and fostering gender equality in the local communities in Sarlahi and Mahottari districts of Nepal. Over 90 percent of rural households in Nepal use firewood for cooking, heating etc.

The use of firewood produces CO₂ gas, harmful fine particles and other gases. The proposed solution of replacing firewood from indoor kitchens with pellets improves air quality and decreases the number of respiratory infections, especially for women and children. Hence Arbonaut plans to establish a biomass pellet factory, which will produce a total of 20,000 tons of pellets annually from renewable biomass. The biomass will be collected from forest under-story bushes and grasses, and waste by-products of agriculture, sawmills, sugar and plywood factories.

A start-of-the-art technology (e.g. LiDAR) will be used to map available raw materials. Only 50 percent of the available raw materials will be collected to produce pellets, leaving the remaining 50 percent on the ground for nutrient cycling, biodiversity and local livelihoods. The produced pellets will replace the use of coal and firewood in Nepal, as coal represents four percent of the energy use in Nepal while firewood represents over 70 percent.

The concept tests a new and clean energy type in Nepal, which is in line with the national bio-energy policy, and has a large replication potential.

...replacing firewood from indoor kitchens with pellets improves air quality and decreases the number of respiratory infections, especially for women and children.

The proposed biomass pellet industry is expected to become a viable business after three years – local people will have an opportunity to get 10 percent equity share...

The concept mitigates the climate change by replacing use of fossil fuel energy by biomass energy. The project contributes to the emissions reduction aspiration of Nepal in line with the Nationally Determined Contributions (NDC), by removing the highly flammable biomass from the forests and using advanced forest-fire management system.

The proposed biomass pellet industry is expected to become a viable business after three years – local people will have an opportunity to get 10 percent equity share of the industry and possible employment (about 200 local people are expected to be employed by the industry). The project is funded by a Nordic Climate Facility (NCF) Grant financed by the Nordic Development Fund (NDF) and is implemented by Arbonaut Ltd. in Finland (Lead), together with Bakas Renewable Energy Ltd in Nepal.

GENDER AND RENEWABLE ENERGY INNOVATIONS FOR SOCIO- ECONOMIC EMPOWERMENT



The SAPP provides a forum for regional solutions to electric energy problems...

Introduction

The Southern Africa Power Pool (SAPP) was created in August 1995 at the Southern African Development Community (SADC) Summit held in Kempton Park, South Africa, when member governments of SADC (excluding Mauritius) signed an Inter-Governmental Memorandum of Understanding for the formation of an electricity power pool in the region under the name of the Southern African Power Pool. The ministers responsible for energy in the SADC region signed the Revised Inter-Governmental Memorandum of Understanding on 23 February 2006.

The SAPP is governed by four agreements:

- ❖ Inter-Governmental Memorandum of Understanding which enabled the establishment of SAPP;
- ❖ Inter-Utility Memorandum of Understanding, which established SAPP's basic management and operating principles;
- ❖ Agreement Between Operating Members which established the specific rules of operation and pricing; and
- ❖ Operating Guidelines, which provide standards and operating guidelines.

The SAPP has 12 member countries represented by their respective electric power utilities organised through the SADC.

The SAPP has four working committees: The Environmental Sub-Committee, the Markets Sub-Committee, the Operating Sub-Committee, and the Planning Sub-Committee, under a Management Committee which reports to the Executive Committee. The Coordination Centre Board governs the activities of the SAPP Coordination Centre. The SAPP coordinates the planning and operation of the electric power system among member utilities. The SAPP provides a forum for regional solutions to electric energy problems as espoused in its Vision and Mission statement.

Organisational Projects and Innovation to Enhance Socio- Economic Empowerment through Renewable Energy Access

The SAPP has among other interventions, identified plausible solutions to increase access to electricity services

This aids to ensure equitable participation in and equal benefit from the resources, services, capacity building and other activities offered by the project.

in the SADC region. This is against the background that electricity is a driver for socio-economic development as well as addressing the gender inequality that exists due to its limited access.

Expansion of the SAPP Generation and Transmission Capacity

SAPP through its Project Advisory Unit (PAU) is tasked with the preparation of projects to bankability for implementation. This is achieved through the preparation of the required studies such as technical feasibility and Environmental and Social Impact Assessment (ESIA). These projects are as espoused in the list of priority projects approved by the SADC Energy Ministers and the SAPP Pool Plan, and adopted for implementation. The projects are ranked based on the following:

- Category 1: Project to integrate a non-operating member to SAPP network.
- Category 2: Project to relieve transmission congestion by adding capacity.
- Category 3: Project to connect new generation infrastructure to load centres.

These projects were identified to have significant regional impact in ameliorating the power deficit and include the following generation and transmission projects: Angola-Namibia; Kolwezi-Solwezi; Malawi-Zambia; Mozambique-Zambia; Zambia-Tanzania and Luapula; Mphanda Nkuwa and Batoka Gorge Hydropower.

The ESIA process, as guided by the SAPP Environmental and Social Management Framework (ESMF), addresses gender aspects by aiming to formulate projects that analyse the roles and needs of women and men and their vulnerability. This aids to ensure equitable participation in and equal benefit from the resources, services, capacity building and other activities offered by the project. The response to gender is embedded in all stages of the project cycle: project preparation, design, implementation, and monitoring and evaluation. In addition, special gender consideration for project-affected parties that suffer from loss of livelihoods and/or property, especially for women- and child-headed households are taken into consideration.

SAPP Electricity Market Structure

SAPP has through the years progressed in an evolutionary manner to open the market for more trading through new products. In this way SAPP through its market development achieved a gradual implementation of competitive power

...coal-fired power stations produce greenhouse gases such as carbon dioxide which result in climate change.

markets, slowly moving SAPP from being a cooperative pool to a more competitive pool while keeping its focus on the regional context. This has proven to be an effective methodology for the region that is also supported by many of the successful international experiences. SAPP further intends to connect to the East African Power Pool, to optimise the availability of the electricity in the two power pools.

Needs Assessment Study on Renewable Energy Proposals in SAPP

The SAPP currently has electricity generation from thermal (coal), hydropower, nuclear and gas. In terms of the generation mix, thermal (coal) tops the list with 62 percent, hydropower 21 percent, distillate 4.4 percent, nuclear 3 percent, wind 3 percent, solar 3.9 percent, gas 1.5 percent and biomass and landfill at 0.1 percent. This situation is not sustainable since coal-fired power stations produce greenhouse gases such as carbon dioxide which result in climate change.

The SAPP has realised the need to increase the contribution of renewable energy in line with general global thinking of reducing the carbon footprint. Increasing renewable energy's contribution will also result in the increase in primary energy diversification and increase in the security of supply. A study conducted on the impact of renewable energy on the SAPP revealed that the infrastructure and market platform are generally adequate to support the penetration of renewable energy into the system.

**PROMOTING WOMEN
SMALLHOLDER FARMERS'
SOCIO ECONOMIC
EMPOWERMENT AND
GENDER EQUALITY THROUGH ENERGY
TECHNOLOGIES PROJECT.**



Mandate is to uplift and improve the living conditions of poor and marginalized communities (men, women & youths) with a special focus on women in projects utilizing local resources...

Introduction

The Centre for Gender and Community Development in Zimbabwe (CGCDZ) is a non-governmental organization which was legally registered and established on the 1st of September 2016 (Trust Number: MIS 0001171). CGCDZ's mandate is to uplift and improve the living conditions of poor and marginalized communities (men, women & youths) with a special focus on women in projects utilizing local resources through economic empowerment, citizen participation and climate change, mitigation and adaptation. Although CGCDZ is a gender-sensitive organization, it focuses mostly on women, recognizing that they are the key drivers of economic growth in most emerging market countries, Zimbabwe included. CGCDZ takes community centred and community led initiatives as the basis for all interventions and livelihood activities. This enables the initiatives to contribute towards mainstream development processes. CGCDZ also intends to build a centre which will become the hub of all its activities. The centre will provide market linkages for our community partners' products and skills, and also an income-generation facility through provision of conference and boarding facilities.

CGCDZ realizes and understands that it does not have all the technical, financial and human skills to accomplish its mandate and therefore places great importance on the development and nurturing of partnerships at community, district, provincial, national and international levels. This enables the organization to take advantage of the competencies and experiences of other organizations to achieve maximum impact in its interventions.

Energy Technologies Project

Gender-based inequalities, structural barriers and discriminatory social norms along the food-production value chain impede the socio-economic empowerment of women smallholder farmers. Although rural women constitute the larger percentage of the labour force and contribute to food and nutrition security at the household level, they face a number of challenges due to multiple roles, mostly unpaid work.



...to promote women smallholder farmers' socio-economic empowerment and gender equality the CGCDZ adopted activities related to capacity development sessions that included men and women...

Survey results from a research conducted by CGCDZ in 2019 indicated power imbalances against women in the energy sector and those women who fail to contribute income at household level. Economic hardships coupled with the movement restrictions caused by the outbreak of COVID-19 and lack of energy technologies to reduce women's workload in Zimbabwe generally and rural areas specifically, had a bearing on increased abuse of women. It is against this background that CGCDZ endeavours to promote women smallholder farmers' socio-economic empowerment and gender equality through advancing energy technologies. CGCDZ uses the term "community partners" when referring to beneficiaries. The organization adopts a participatory approach and partner engagement to programming as an ownership and sustainability plan, post funding.

In an effort to promote women smallholder farmers' socio-economic empowerment and gender equality the CGCDZ adopted activities related to capacity development sessions that included men and women discussing gender equality, energy technologies infrastructure development and initiating village lending and saving schemes to enable women raise income and assets.

CGCDZ particularly work with smallholder farmers in rural areas where the pressures of earning a living with little resources have led to deforestation for charcoal production. Degraded soils from monoculture maize fields fed with costly fertilizers and pesticides had made farming hard and unproductive. CGCDZ's training in regenerative agriculture focuses on farming a more varied set of crops, improving soils with compost fertilizer, bio-char from waste charcoal dust and 'no-dig' mulching techniques, using natural pest control, and watering from new water harvesting tanks and drip irrigation kits has helped improve the income of women in society.

CGCDZ with support from a philanthropist assisted 10 vulnerable households of 7 female and 3 males to light their homes through the solar home-systems project. The identified households had suffered discrimination and exclusion due to their status as internally displaced persons. Sustainable energy for smallholder women farmers has enabled gender equality through improving household income. The project focuses on renewable energy technologies and services for irrigation, drying and cooling for smallholder women farmers in horticultural value chains. This was adopted to reduce the burden for women who walk long distances to fetch water for irrigation purposes.

**DEVELOP, ENGINEER,
CONSTRUCT AND
OPERATE A 25MW SOLAR
PV GENERATION FACILITY
IN SESHEKE, WESTERN PROVINCE OF ZAMBIA**



GreenCo, being a women-led start-up, upholds and values the provision of more energy access for girls and women empowerment.

Introduction

Africa GreenCo Group via its operating entity GreenCo Power Services Limited acts as an intermediary offtaker and service provider, purchasing power from renewable IPPs and selling that electricity to utilities and private sector offtakers (i.e. commercial and industrial users) and markets of the SAPP. GreenCo will mitigate the risk of purchaser default through an ability to secure alternative buyers or through short-term trading on the SAPP electricity markets. Its mission is addressing creditworthiness to increase generation and growth of renewable energy markets through partnerships and innovative solutions. Through its participation in competitive power markets, GreenCo aims to promote cross-border power transactions and a more dynamic and liquid short-term power market. Through its activities, GreenCo will increase the supply of, and demand for, finance for energy projects, and mobilise private sector capital more quickly towards critical and transformative capacity addition.

25MW solar PV generation facility in Sesheke to the Ilute Solar PV Project

GreenCo, being a women-led start-up, upholds and values the provision of more energy access for girls and women empowerment. The voices and participation of women is pivotal because they have valuable knowledge and practical experiences that contribute to building the resilience of community.

Their commitment to gender equality will incorporate and take cognisance of gender mainstreaming matters within the organization as well as ensuring that gender considerations are appropriately addressed by the companies with which it contracts, including independent power producers with whom we enter power purchaser agreements. GreenCo acknowledges the meaningful participation, upskilling and empowerment of women in the energy sector.

The energy sector is an area where the imbalance and the undue burden on women are still prevalent.

Affordable and clean energy from alternative renewable green economy sources is at the heart of what GreenCo does. To expand energy access, it is crucial to enhance energy efficiency and to invest in renewable energy. GreenCo aims to do this by scaling up affordable clean energy; reducing the cost of renewable energy; and reducing credit risk for new renewable-energy transactions. This is achieved through embarking on the utilisation of regional power pools such as the SAPP to expand market opportunities and eradicate the requirement for fiscal support for new generation projects.

GreenCo is pleased to announce the news of their first project. The selection of the winning developer and the award of the tender to develop, engineer, construct and operate a 25MW solar PV generation facility in Sesheke, Western Province of Zambia, to the Ilute Solar PV Project (“Ilute Solar”), a consortium comprising Western Solar Power Limited (formed by Buffalo Energy and the founders of Western Power Company), Serengeti Energy Limited (formerly Responsibility Renewable Energy Holding) and China Energy Co. Ltd, a subsidiary of China Energy Engineering Corporation. This collaboration between GreenCo and Ilute Solar is yet another milestone in the realization of transformative developments in Zambia’s electricity sector, one that will see the private sector playing an increasingly important role in developing new, affordable, green power in a commercially and environmentally sustainable manner, through the innovative approach to risk allocation and capital deployment that GreenCo has espoused which reduces reliance on sovereign fiscal support to bring new generation capacity online.

The organisation seeks to ensure that environmental, social and gender policies are adhered to throughout the operation of our solar pilot project. GreenCo is committed to promoting gender equality, having a proactive reach to vulnerable groups, community engagement and environmental/social awareness. The status of women has improved in many ways over the years. However, inequalities still remain. The energy sector is an area where the imbalance and the undue burden on women are still prevalent. There is now an increasing appreciation in international development

The low rate of access to energy, to clean cooking fuels, to education and technologies require an innovative approach to finding solutions to current challenges.

discourses of the role of energy as a conduit for redressing historic gender inequities. Gender inequality hampers a country's ability to make use of the full spectrum of capabilities of a population, and it restricts the opportunities of younger generations to excel.

Women constitute 52 percent of the Zambia's population but at the same time face severe difficulties in fully participating in various local and national development processes and programmes.

GreenCo being women-led has its ambitions to hire more women employees to require a proactive approach in overcoming the shortage of qualified applicants. The organisation has reached out directly to universities in and around Zambia to identify promising women students engineering and law to enrol in our corporate internship program. Further, two women interns, who are recent graduates in engineering and law respectively, have been engaged for a 12-month period.

Over time, users realize the benefits of the cleaner options in energy, which can influence their decision-making. The low rate of access to energy, to clean cooking fuels, to education and technologies require an innovative approach to finding solutions to current challenges. GreenCo is technology open when it comes to renewable power and seeks to provide affordable green energy. GreenCo is aware of the positive effects of biomass communities, if the right biomass is used, as it can generate base-load power. GreenCo also seeks to engage with civil society organisations and views this as key to recovering from setbacks in areas such as time poverty, access to energy, clean cooking, women empowerment, pollution and overall contribution and development to these communities. There are benefits of renewable energy to social services as follows.

Transport

Wood fuel has become scarce and women travel long distances to fetch it hence spending a lot of time which could be used in other beneficial activities. Expanding the renewable share of transport energy will require innovation that supports biofuels, electric vehicles, renewable electricity generation, active mobility, and the phasing out of fossil fuels for transport.

Lack of access to electricity affects the education of both the boy and the girl child since they are not able to study after the dark

Education

Lack of access to electricity affects the education of both the boy and the girl child since they are not able to study after the dark and the communities might have a challenge in recruiting qualified teachers. Studies on electrification programmes have demonstrated positive impacts on education of both boys and girls. There is some evidence that the positive impacts are larger for girls since electrification as it reduces the time spent on daily chores such as fetching water and collecting wood, increasing girls' opportunities for schooling as well as for after-school study.

Health

Women in Zambia assume the role of caretaker while maintaining their roles of providing food and maintaining the household. This places a heavy burden on women suffering from ailments such as HIV and AIDS. Lack of access to clean water, sanitation, and hygiene facilities have profound impacts women's security and safety, as well as increasing prevalence of disease, which the risk experienced throughout the country, will be exacerbated by climate change. Cooking on firewood has health implications for women and children due to inhalation of polluted air from the fumes. During firewood collection women and girls are vulnerable to sexual and gender-based violence as well as an increased risk of snakebites. The long walks and heavy loads can lead to persistent back pains and pose a risk to pregnant women. Further, women are exposed to open flames and smoke which results in respiratory problems and cataracts – the leading cause of blindness in developing countries. The World Health Organisation (2016) estimates that about 4.3 million people die prematurely every year from exposure to smoke from traditional cook stoves and open fires. Men on the other hand are more exposed to hazardous work on energy infrastructure such as electrical wiring and chemical handling with risks of injuries.

With their new project underway, GreenCo recognises the importance of stakeholder input and participation. GreenCo is developing mechanisms to promote the input and participation of important stakeholders in the design, development and implementation of energy infrastructure, including civil society organizations.

LIGHTING THE WAY TO WOMEN'S ECONOMIC EMPOWERMENT IN ZAMBIA



SAEP integrates social and gender considerations into the planning, programming, and execution of activities...

Introduction

The United States Agency for International Development (USAID) Southern Africa Energy Program (SAEP), a Power Africa initiative, works to advance energy policy and regulatory reform and accelerate investment to increase power generation and access to electricity throughout the region. SAEP is USAID's flagship implementing mechanism for Power Africa in the Southern African region. As part of Power Africa, SAEP works to contribute to Power Africa's continent-wide goals of increasing new power generation by 30,000 megawatts and increasing new connections by 60 million by 2030.

SAEP integrates social and gender considerations into the planning, programming, and execution of activities to: i) increase access by women to modern electricity services to enhance social and economic opportunities; ii) increase female employment opportunities at utilities and government agencies; and iii) increase the number of women trained in electricity reform and associated fields.

A Gender Success Story



Teresa inside her shop in Chadiza from which she sells, among others, pay-as-you-go solar home systems Photo: USAID Southern Africa Energy Program

Teresa was a PAYGO client frustrated with the long distances and time spent traveling to purchase top-ups for her SHS.

Teresa lives in Chadiza, a small town in Zambia's Eastern Province, where she runs a one-stop-shop that offers drinks, food, and toothpaste, as well as pay-as-you-go (PAYGO) solar home systems (SHS). Through her business savvy and an opportunity provided by SHS Company, VITALITE, Teresa has significantly improved her own economic wellbeing, as well as that of her community. In Zambia, where only four percent of the rural population has access to electricity, private sector SHS companies are expanding their reach to accelerate the delivery of off-grid connections. The USAID Southern Africa Energy Program (SAEP), a Power Africa initiative, supports SHS companies by training employees to improve SHS sales and increase connections.

Along with sales training, VITALITE requested SAEP's support to promote gender equality in its operations. SAEP conducted a gender mainstreaming workshop in Lusaka, Zambia, in April 2019 for VITALITE's human resources, sales, and marketing teams to integrate gender into their work and attract more women to become sales agents, which could create economic opportunities, especially for women in rural areas. SAEP and VITALITE then visited rural communities like Chadiza to meet with customers and sales agents. This is where Teresa's potential for growth came to light.

Teresa was a PAYGO client frustrated with the long distances and time spent traveling to purchase top-ups for her SHS. She wanted to do her own top-ups and sell to her neighbours and one-stop-shop clients. She wanted to become a sales agent. VITALITE was impressed by Teresa's enthusiasm and keen eye for business, so they hired her as an SHS sales agent in Chadiza. Today, Teresa runs her house, shop, and next-door tavern on an SHS from VITALITE. Plus, as a VITALITE sales representative, she is now a literal source of light for her community. Teresa is a role model and a prime example of women as key drivers of innovative and inclusive solutions.

Teresa likes the SHS so much that she bought and is paying for a system for her child and grandchildren. "They [grandchildren] were so excited when they heard they were getting solar. Now they can study at night without worrying." Teresas credits her success as a sales agent to the network she gained through distributing mosquito nets as a volunteer for a local health initiative combating malaria. Teresa believes volunteering helped her earn trust among the community and is happy to use that to provide electricity via SHS products.

DOROTEIA HIPOLDINA DOS SANTOS ISAÍAS

GENDER CHALLENGES IN ACCESS TO RENEWABLE ENERGY FOR IRRIGATION IN DEVELOPING COUNTRIES *Biography.*

Introduction

Doroteia Hipoldina Dos Santos Isaiás has more than 10 years of experience in gender and energy. Graduated in Educational Physics in 2008, where she defended her thesis with the theme: Gender Disparity in Physics Teaching. In 2010 she concluded her Masters in Physics. She is a lecturer in the Department of Physics at the Eduardo Mondlane University in Mozambique since 2008. She is the focal point of gender issues in the Physics department since 2009, and has participated in several seminars, conferences and trainings about gender mainstreaming in science, inside and outside the country. She has participated in projects developed by UNESCO and non-governmental organizations as well as institutional projects related to gender issues. Currently she is doing her PhD on energy technologies for pumping water for irrigation. She is open to learn more and contribute to the reduction of gender inequalities in access to renewable energies, among others.

Case study from Mozambique

In rural areas of developing countries as well as in peri-urban areas, energy supply is still far from optimal. The population depends mainly on wood, biomass and agricultural waste to meet their basic needs. In irrigation systems, energy is also needed. Unfortunately, most small-scale farmers either practice rain-fed agriculture or have diesel oil as one of the most used fuels to pump water for irrigation. However, this dependency does not always bring good results. The practice of rain-fed agriculture limits the diversity of crops for food and for marketing. The use of diesel oil, depending on the location, has problems of reliability and availability, in addition to the high costs often applied.

In Mozambique the irrigation potential has been estimated at about 3.1 million ha, while other sources give 3.3 million ha. About 40 percent of the 800,000 square kilometres of Mozambique's territory is arable land. And of that percentage only 10 percent is cultivated, of which only 1 percent is in the hands of commercial agriculture. The remaining 99 percent of cultivated land is in the hands of subsistence farmers and

The practice of rain-fed agriculture limits the diversity of crops for food and for marketing

...ensuring equal access to opportunities related to renewable energy in irrigation will contribute to the mass use of these technologies...

is spread over about 4.0 million small farms of 1 to 10 hectares. In Mozambique, women represent 52% of the population and, of this number, 72.2% live in rural areas. Women and girls are among the groups most affected by poverty. Mozambican women represent the largest force employed in agriculture, however, their participation in the value chain of the sector is still very low compared to that of men.

Although Mozambique has a great potential in terms of renewable energy for irrigation, the beliefs and customs existing in various regions, the limitation of access to credit lines, education and political issues, make it difficult for women to access these energy resources. As a consequence, they make crop irrigation ineffective and cause low crop yields. Thus, this study aims to encourage farmers to use modern technologies to meet the water requirements for irrigation. Recognizing the gender inequalities in access to modern energy services, the study aims to contribute to the access to renewable energy for both men and women without discretions.

Overcoming these limitations and ensuring equal access to opportunities related to renewable energy in irrigation will contribute to the mass use of these technologies for irrigators, their families, their communities and the country as a whole. For energy transitions to occur at 100%, it is necessary to overcome these and many other obstacles that do not allow women to grow at all levels equally with men.

While funding was repeatedly raised as one of the challenges, it was clear that there were various innovative ways of dealing with such a challenge.

CONCLUSIONS AND RECOMMENDATIONS

The conference provided a platform for sharing multilevel experiences on mainstreaming gender in the renewable energy sector from the international, continental, sub-regional, national and the local community levels. Challenges hindering equal participation by men and women were identified, ranging from access to funding, lack of information on funding or business opportunities, cultural barriers that generally relegate women to peripheral roles in society, to gaps in policies at national and regional levels. The presentations provided lessons that can be shared across communities or borders, which was the essence of the conference.

Solutions were also proffered, for example on what can be done for more women to participate as entrepreneurs taking advantage of the business opportunities that abound along the renewable energy value chains. Country experiences were shared on what some Member State governments are doing to integrate gender issues in the RE sector. Emphasis was made on the need to strengthen mechanisms that allow for access to opportunities and that these should be distributed equally in society so that socially vulnerable groups such as women are not excluded from the opportunities arising from the RE value chains.

While funding was repeatedly raised as one of the challenges, it was clear that there were various innovative ways of dealing with such a challenge. For example, the South African prototype of Smallscale Impeded Generation initiative is a mechanism that seeks to pool resources by women which allows them better chance to compete in the RE value chains in the country. A similar model can be replicated across communities and in other countries. Funding partners such as ADA are also seeking to address access to finance by promoting catalytic funding that seeks to address issues of mainstreaming gender in RE with a view to making Sustainable Development Goal (SDG) 5, on ending all forms of discrimination against all women and girls everywhere, becomes a reality.

Emphasis was also put on the need to address legislative frameworks whether at national or regional

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levels and leveraging on the objectives of the SDGs and the Paris Agreement on climate change, the AU agenda 2063, the SADC Regional Indicative Strategic Development Plan (RISDP) 2020-2030 and SADC Vision 2050. To this end, the need for policy harmonisation among the national and regional structures such as SAPP, SACREEE and others was reiterated. While gender audits were proposed for such structures if gender parity in the RE sector and all other economic spheres is to become a reality. The question was, to what extent are these key national and regional structures and institutions promote gender parity in their pursuit of the development targets in the RE sector?

While access to solar remains key, other technologies that allow for space heating, cooking and heating water such as biogas need to be explored further at community levels to assist women with their multiple societal responsibilities while also saving the environment from over reliance on wood fuel. It was noted that while the expansion of grid electricity was advancing and welcome, affordability remained an issue especially for the economically marginalised communities in rural and peri urban areas. More appropriate technologies targeted at heating and cooking therefore become imperative.

The following is a summary of the key recommendations made:

- The need for baseline studies on gender in renewable energies at national and regional levels which can be the basis for monitoring and tracking progress going forward;
- Mapping exercises of the policy and regulatory framework to ascertain the gaps and impediments to efforts at mainstreaming gender in the RE sector;
- Gender audits for key national and regional institutions such as relevant government ministries, SOLTRAIN, SACREEE, SAPP and related subsidiary organisations that are tasked with promoting RE to ascertain their preparedness or limitations to mainstreaming gender in their activities and programmes;
- Based on the findings of the gender audits, design capacity building interventions to address gaps among

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the key national and regional structures and institutions;

- Need for more information and advocacy on innovations and opportunities that promote sustainable energy solutions to increase the participation of women and free their time for other income generating activities;
 - Cognisant of the multiple roles that women play in society, gender mainstreaming programmes should be designed with these realities in mind;
 - Urge member states to institutionalise gender responsive budgeting that allocates specific resources targeted at addressing disparities in the RE sector;
 - Promote strategies that seek to pool investment resources so that women can participate in RE value chains especially for large scale projects and not just be relegated to small scale projects;
 - Promote mini hydro electricity grids at community level that allow for wider access as compared to solar which is often restricted to family rather than community access.
 - Greater political will and high-level support that raises the profile of the benefits of mainstreaming gender in the RE sector in SADC is needed to give better traction to the cause.
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