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Assessment of Women Involvement in the Household Energy Consumption and Other Roles Played in View to Improve and Innovating Propositions in Five Perriferic Villages of Garoua City in Benoue Division in North Cameroon

¹ Ahmadou Bouba, ² Abramidi Odette, ³ Douswe Djamo Bernard, ⁴ Djamilatou Dourmani, ⁵ Moussa Ibrahim

¹ Institute of Research for Agriculture for Development (IRAD) Garoua, Cameroon

^{2, 3, 4, 5} Students, Paramedical Professional Institute of Environnement and Nature Protection of Garoua POBOX/ 258 Garoua, Cameroon

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Corresponding Author: Ahmadou Bouba

Abstract

The paper aimed to assess the poor Women in five periferic village of Garoua city depend on natural resources for house hold survival. Including walking longer distances for wood, water collecting, farming, annimal gardenning, post harvest of crops. In view to improve and innovating solutions. From 2019 to 2021 students from training professional schools, assess 100 women at random from five periferic villages of Garoua City. As results women participation in the fields: are involved in plowing (50%), sowing (80%), weeding (60%), the harvesting and transport of products (60%). Post-

harvest processing: They carry out a large part of the dehulling (90%) and product storage (up to (80%). They cannot afford to pay gaz cooking due to poverty level. They sometimes sell wood, part of millet, maize, beans and green leaves as a source of income These practice are becoming more arduous consume significant time and energy, impacting their ability to engage in finance credits. Bio-coal, also known as ecological coal or green coal, is a solid fuel made from readily available, carbon-rich organic waste from farms and homes.

Keywords: Assessment, Women, Natural Resources, Improving and Innovating Garoua-Benoue Division- North -Region - Cameroon

Introduction

In Cameroon Septentrion including (Adamawa, North and Far North), wood and coal dominate household energy consumption, with wood accounting for 82.3% and coal for 30.6% according to the UN Development Programme (UNDP 2018) [27]. This reliance on wood fuels, particularly in rural areas and regions like the Far North where firewood usage reaches 95%, intensifies deforestation, pollution, and greenhouse gas emissions, threatening biodiversity and food security. Though fuelwood consumption not only distresses local settings, environment, climate but also has political, social, economic consequences.

"Bio-coal, also known as ecological coal or green coal, is a solid fuel made from readily available, carbon-rich organic waste from farms and homes. This innovative solution, gaining traction in Cameroon and other southern countries, offers a sustainable alternative to traditional charcoal. Produced in the form of briquettes or balls resembling traditional charcoal pieces, bio-coal can be made from a variety of organic waste sources depending on the region and its economic activities. These include sawmill waste, agricultural waste, household waste, and food industry waste," the UNDP explains.

Women in these areas are heavily involved in cutting wood for fuel, a practice that is becoming more arduous due to deforestation and drought. This tasks consume significant time and energy, impacting their ability to engage in other activities like income generation. In response, women have adopted various coping strategies, including walking longer distances for wood, switching to cutting green wood when deadwood is scarce, and adapting cooking methods, while also sometimes selling wood as a source of income.

Previous studies argue that women's livelihoods affect forest degradation. Geist & Lambin (2004) suggest that gender inequalities can be reduced to an issue of economic poverty. By producing income generating activities for women and support their entrepreneurship these issues can be solved. By bringing women out of the informal sphere, which means marginalization

because of isolation from markets, to the formal market they are also taking part in the modernisation of traditional division of labour. Though Westholm & Jonsson (2015) still suggests that women's economic participation and increased income does not automatically lead to empowerment of women in the households. Though, for stakeholders such as development agencies, the state and institutions it might be an easy way out to use gender issue as a problem of poverty instead of admitting power relations, subordination of women within this fields as a reason.

Literature

Women, especially rural women, is the most vulnerable group in society since many of them tend to be found in the poorest segments of the population. Women are discriminated concerning labour division and depend on natural resources for survival. Changes in the climate and natural degradation, especially forest degradation are threatening their livelihoods (Chikulo, 2014). Women are not only hit hardest by environmental problems. Their effects are also more lasting on women because of their responsibility and dependency burden for their children (Steady, 2014) ^[22]. Furthermore, fuelwood usage for cooking has negative effects on people's living condition and health. Especially to women it poses a health threat regarding the burden of workload (Bensch & Peters, 2013) ^[4]. Fuelwood consumption not only distresses local settings, but also the environment and the climate in a global perspective. Furthermore, it has political, social, economic and extensive environmental consequences, such as soil erosion and decreased fertility, droughts and flooding, ecosystem and biodiversity loss, forest degradation and in dry areas like Senegal, desertification (Wurster, 2010 ^[32]; Chikulo, 2014). Unsustainable woodfuel extraction, which means extraction that is overweighting regeneration, drives degradation of forests and climate change (Bailis, Drigo, Ghilardi, *et al.*, 2015) ^[3]. Women in Africa have been among the first to observe consequences that come along with climate change and experience the changes and effects it has on their livelihoods (Wurster, 2010 ^[32]; Chikulo, 2014), therefore women are in focus of this paper and therefore this choice of topic is relevant for global studies. This paper attempts to research perspectives of sustainable development and environmental processes as well as social relations and gender inequality. Local as well as global perspectives are considered and discussed within this study. This is up to date and highly relevant for the field of global studies since we are living in a constantly changing world. Gender relations are structured around managing the environment where women are seen as major users and managers of the forests (Steady, 2014) ^[22]. Some researchers suggest that women are affecting the degradation of forest through firewood and other livelihood activities related to forests collection (Bailis, Drigo, Ghilardi, *et al.*, 2015) ^[3]. Other researchers suggest that forest degradation is highly affecting women's livelihood, their fuelwood collecting activities and their alternative livelihood activities related to forests (Chikulo, 2014; Bryant & Bailey, 1997). Yet, others suggest that activities that result in land use changes, for example expansion of agriculture and urbanization are not easy to separate from fuelwood collection activities (Sola, Paolo, Zhou, *et al.*, 2017) ^[20].

Feminist political ecology (FPE) has been applied by researchers who studied about women's livelihood

activities. FPE was developed in the 1990s from an approach focused on gender, women and development, named "women, environment and development", also known as WED. FPE is considered broader and more complex with a historical aspect that needs to be taken in consideration when analysing research, such as globalization and colonization. FPE as an approach allows generalizations but not homogenization, which has been an issue of WED as the historical analysis of inequalities has not been considered (Goebel, 2004) ^[11]. Shandra, Shandra, & London (2008) have applied feminist political ecology theory, to explain how women disproportionately are affected by environmental degradation, due to gender divisions regard to access, control, and knowledge of natural resources. Women remain discriminated when it comes to labour, access to land and, forest resources. FPE has also previously been used by researchers such as Hanson (2016) and Harcourt, (2016) ^[12] when looking at women and their livelihoods. Harcourt (2016) ^[12] use the feminist standpoint in order to examine women's experiences and knowledge as different from men's. These differences in knowledge and experiences have their origin in social power structures and knowledge relations. Hanson (2016) uses feminist political ecologies in her study about women's motivation for collective organizing and participation to explain how women's knowledge played an important role when understanding environmental changes and processes. According to Di Chiro (2008) ^[8], feminist political ecology is examining the concepts of relations and processes. It investigates in what way power, gender and knowledge are filtered through livelihoods and environmental processes. Gender is analysed as a social category that shapes and instruct social relations with nature and determine the division of responsibility and occupation between gender. Men and women hold specific knowledge about nature. According to Harcourt & Nelson (2015) ^[13], feminist political ecology is dealing with social relations of power and justice associated with cultures, economic and ecologies in relation to various ethnicity, socio-economic status, gender, sexuality, religion and other combination. Sustainable livelihoods started to appear in development agencies practices in the 1990's and UNDP was early to get influenced and make use of the framework. UNDP's definition of sustainable livelihoods incorporates assets, skills and approaches which humans will be using to survive. A group of people or individuals have sustainable livelihoods when they can handle and overcome stress and crisis and furthermore maintain their assets or even improve them without overusing the supplies of natural resources which they are so dependent on (UNDP, 2017). A recognised definition of livelihood comes from Chambers and Conway (1992) ^[6], which UNDP used as a reference when defining their sustainable livelihoods approach. Livelihood consist of the assets, capabilities and activities required as a means of living. Livelihood is sustainable when coping and recovering strategies from shocks and stress is possible. When assets and capabilities can be maintained and improved and when sustainable opportunities can be passed on to the next generation. Both in the short and long run this helps to benefit other livelihoods at a local as well as at a global level (Ajala, 2008) ^[1]. Ajala (2008) ^[1], has introduced livelihoods as functions of locations where certain locations are possessing certain resources that yield better opportunities and profit

than other locations. People who are living in unprofitable areas such as deltas, deserts and other marginal land are often experiencing issues in sustaining their livelihoods.

Livelihoods is a gathered measure for how a group of people or an individual is making a living within the limit of the society within which they are living. Social, political, economic and environmental limits are set by the area and society. Looking at livelihoods at a local micro level, these limits of the area are what determines human welfare of a household. At a macro level, welfare of communities, regions and nations are determined (Ajala, 2008) [1]. To consider a person to be poor, they do not have access to resources or they do not have sufficient resources in order to provide with water, food, clothes, shelter, warmth and other necessities to reach the basal needs for themselves or for their family. This is considered a life of unsustainable livelihoods. Different practitioners emphasise livelihoods framework differently, what is common is that the framework identify what people are struggling with in order to handle uncertainty and risks, connections are drawn between different factors that limits or improves their livelihoods, likewise work done by institutions and policies are included in the wider environment. The framework identifies measures in hope for strengthening assets, improve capabilities as well to reduce vulnerability (Ajala, 2008) [1]. Studies on Women's activities have shown that rural households in Sub Saharan Africa are engaged in several livelihood activities and strategies. Strategies can be diversification in income generating activities. Buckingham-Hatfield (2000), Jackson (1993) and Agarwal (1992) describe women as highly reasonable for the household labour. In rural settings women depend on natural resources to provide the household with food, fuel and an income. Environmental degradation and especially deforestation are causing difficulties for women to provide a living (Agarwal, 1992). Women's main work is perceived to be household work. They are often unpaid and invisible in their work. These efforts are not recognised nor are they given an assurance of economic return. Women's work is not considered economically productive even though they are involved in full time household work (Unnayan, 2014). 2.3.3 Environment and sustainability Demand for wood are claiming forests while forests at the same time is a crucial resource, especially for women living in rural areas. People collect and use the wood in their own household as well as it can be collected and sold for an income (Muzirikazi, 2016) [17]. Climate change is gender sensitive due to the different impact it poses on men and women, power structures, access to resources, and education and knowledge. Women's lives are more connected to the environment and therefore more directly affected by the changes in forms of loss of food supply, loss of income and loss of livelihood (Steady, 2014) [22]. Environment can be seen from different perspectives depending on the person or community defining it. The definition sustainability stands for protecting and preserving enabling conditions in order to be able to accomplish social reproduction, which for vulnerable and marginalised groups have become more and more difficult (Di Chiro, 2008) [8]. Women in Senegal within fuelwood collection are living within vulnerable environments that are going through degradation. Resources are getting harder to access and their activities to provide a living is getting more and more tiresome and time consuming. According to Gherasim & Tanase (2012) [10], sustainable development needs to have a

focus on strategies to achieve social and economic progression without harming the environment in the 7 process. Dernbash (2003) suggests that environmental protection and development cannot be separated from each other to achieve sustainable development. On January 2016, the United Nations implemented the 17 Sustainable Development Goals (SDG) with 169 targets. The SDG's are built on the Millennium Development Goals (MDG) and aim to complement and go further to end all forms and dimensions of poverty. The Sustainable Development Goals of the 2030 Agenda for Sustainable Development seek to balance all the core elements of sustainable development, namely, the social inclusion, environmental protection and economic growth and aim to reach the targets by 2030. (Sustainable development goals, n.d.a). The sustainable development goals are connected to the issues we can see in Senegal, both in Casamance and Sine-Saloum. The most important connections are found between goal 5, Gender Equality, and goal 15, Life on.

Site study: Map of Garoua city and Northern Region



Fig 1: Map of Garoua city and high quarters



Fig 2: The map represents Northern Region and peripheral Benoue division villages

The three villages of five are localised along the national Road No 1. Including Bocklé, Sanguéré and Djalongo at 8, 10, 15 km respectively from the Garoua city. They are on the direction going to Adamawa towards the South Cameroon. While the two other villages Babla and Kismatari are in the Northern-East of Garoua city and the road is not well accessible and not tired.

The relation between deforestation and poverty have been exaggerated as a development strategy by institutions, where the reduced deforestation and poverty reduction has been set up as an automatic and immediate empowerment of women (Westholm & Jonsson, 2015). This contradicts with Steady

(2014) [22] who suggests that poverty leads to higher vulnerability to environmental destruction.

There is a connection between environmental degradation and poverty, especially women and children. Shandra, Shandra, & London (2008) suggests that there is no correlation between economic growth and development, and deforestation, but on the other hand suggests that there have been many studies focusing on the relation between low level of forest degradation and high level of NGO's in one country. What is missing is once again women's effort in this.

Characteristics of long rod biomass such as logs, wood, sawdust, and jute rods. It adopts horizontal structure, manual charging, cart feeding, and discharging, and advanced hot air dry distillation.

The carbonization process technology adopts the unique carbonization combustible gas back-burning technology so that the flue gas generated by carbonization can be fully utilized to meet the heat demand of the carbonization furnace itself.

To tackle these challenges, the UNDP recently provided a game-changing solution: an ecological charcoal production unit for women's associations in the Far North. This unit, installed at the Centre for Appropriate Technologies (CTA) in Maroua, features five external kilns, a carbonization kiln, a semi-industrial grinder, a semi-industrial mixer, and a cooling chamber, as reported by the state-owned newspaper Cameroon Tribune. Prior to receiving the unit, the beneficiaries underwent training on the eco-charcoal production process, presented as a sustainable alternative to traditional charcoal and its detrimental impact on forests.

This environmentally friendly fuel offers a promising double benefit: reducing greenhouse gas emissions and maintaining clean towns and villages. "By nature, it is biodegradable with a neutral ecological footprint," the UN agency states. "As a result, it produces minimal pollution and helps protect forests and biodiversity."

Methodology and Material

Documentation

Library reading, published papers, internet findings, colleagues correspondances, and field works interview, discussion and meeting.

Working approaches on the field

We focussed our sampling on 5 small villages including: Djalengo, Bokclé, Sanguéré, Pabpla and Djaifatou (5 villages).

In each village we choosed at random; 20 women (with 10 members in the family). They are the key persons for interview since they manage the wood, charcoal and others for energy consumption for the whole family.

In total we had 100 interviewed women.

For each family (with 10 members), the quantity of charcoal used a day has been registered and the site of collecting wood has been known.

Results and Discussion

Pressure on biodiversity is caused by the high demand for energy of the population. Women are at the heart of agriculture, participating in almost every stage of fieldwork, including plowing, sowing, harvesting and processing of products. They are often the main agricultural workforce, but face challenges such as lack of access to land and credit,

discrimination, and the burden of domestic chores in addition to their agricultural duties.

Direct participation in the fields: Women are involved in plowing (50%), sowing (80%), weeding (60%), the harvesting and transport of products (60%).

Post-harvest processing: They carry out a large part of the dehulling (90%) and product storage (up to (80%).

Individual production: In addition to family fields, many women manage their own production, such as okra or peanuts, sometimes in groups.

Specific agricultural systems: In some regions, women are primarily responsible for activities such as rainfed rice farming or livestock breeding.

Challenges and constraints of interviewed women

Women's contribution to semi-arid resource management is generally ignored and/or over looked by researchers and policy makers.

In these villages, women play the role of tractor-physically tilling the ground water pipe by carrying water on the head from wellband to home some time by pousse-pousse or wheelbarrow.

They carry farm produces from the fields farms and markets, they chasing cows and goat and crops, by carrying fuelwood on their head to home, by carrying the children on their backs all day.

A critical analysis of this statement seem to indicate the level of hard work prevailing in our country but at the same time illustrates clearly a vital role played by women. They directly and indirectly participate in the production, processing and marketing of commodities.

They are nomadic and semi-nomadic pastoralist, play major roles in animal production. They have substantial responsibilities in poultry, goats sheep and keeping them. They also collect feeds and fodder for animals, milk and other animal products, play a major role in food storage.

They make decisions about how, where they process food, especially for family consumption and without modern aids. Typical work includes cleaning, threshing and grinding grains, and drying fish and making cheese and yoghurt.

Most women also play a major role in food preparation, especially in local fuel gathering a factor related to vegetation degradation and water search from local wells or rivers that are exposed to many risks.

They are the major assets for purchase, with cattle paid as bride price. They are faced with several constraints which prevent them from making meaningful contribution towards sustainable development of their areas.

The major constraints are: access to credit, input supply, extension support, lack of organization and training, heavy demands from large families, and lack of grass roots level participation in the planning and implementation of projects. Most women work under the umbrella of their husbands as they do not have rights to land and therefore cannot qualify to receive credit from recognized credit sources, therefore limited. Because of this financial constraint, women require training in sound resource management techniques- and this training can be effectively given through extension service-, most extension workers are males due to traditional norms. Male workers find difficulties in approaching the females. They mostly direct their attention to males expecting the techniques to filter down to the women.

Access to resources: Women are often marginalized and have limited access to land, credit, property, and inheritance.

Workload burden: They combine agricultural tasks with domestic work, spending much more time on water and firewood chores, preparing meals, and childcare, which reduces the time available for productive work.

Remuneration and status: Women's work is often unpaid and most of the land they work does not belong to them, and can be taken away in the event of divorce or the death of the husband.

Economic and Social Role

Pillars of the rural economy: Women constitute up to 80% agricultural labor playing a vital role in food production as we see below.



Photos: At left the woman has gathered firewood in the bush, in middle and at the right, women are carrying firewood on their head for house uses when coming bag from the farm



Different quantities of charcoal for sale: bags of 25 kgs at 2000fcfa and those of 100 kgs at 6500 fcfa.

Here below the photos expose the different uses of coal by women in rural areas as in cities.



Charcoal is used for many purposes: in urban areas.

1. Above at left, the woman is cooking cous-cous; at the middle the woman is cooking with the pot, at the right a woman is frying the cake (makala) on a large open pot.
2. Below at the left cow meat (brochettes) is frying on the charcoal fire, in middle a well mixed meat, green spices and onions in the pot in cooking, at the extreme right, fishes are well frying on the charcoal heat for sale.

Energy crisis

The oil crisis coincided with an acute drought which

dramatically affected humans, animals and the environment. It is this crisis, above all, that has affected the Sahel women who, as we said before, use non-commercial energy sources. According to the local communities, the preparation of meals and all related operations belong mainly to the women's sphere. Thus in the countryside women and children are traditionally responsible for gathering the fuels. This tradition still seems to be maintained where men are willing to bring wood from the field for the family. Generally, the man who goes to look for wood does it for a living, and because he has no other source of income. The behaviour of a man who uses a motor bike, a cart or even an automobile for this is significantly different, since for him bringing wood home is no longer considered a sign of inferiority and submission to his wife. On the contrary, it is the recognition of a new situation, that is, that wood has become a rare and therefore valuable commodity deserving the interest of the male sex!

About the long journeys and exertion that wood-gathering duties imposed on women. But the urgency of the problem and the need to find appropriate solutions only became obvious because the whole world is now caught in the convulsions of the oil crisis and because, in the Sahel, the men and those who hold power which comes to the same thing - have begun to feel the burden of the cost of wood on their family budgets and the threat which its disappearance poses to the soil and the climate.

Firewood gathering is women's work. When a man does it, he is subservient to his wife, unless he uses a vehicle a cart, a motor bike, even an automobile. Then he is demonstrating that wood is a rare and valuable commodity worthy of male interest!

With the Comité permanent Inter-Etats de Lutte contre la Sécheresse dans le Sahel (CILSS). This article was taken from a paper she gave at a Seminar on Fuel and Energy Development for African Women in Rural Areas FAO and the UN (1980) Economic Commission for Africa.

Cooking methods vary but can be reduced to three:

Water-cooking, for dishes such as cereal porridges; leaves, boiled for sauces or as vegetables; infusions and so on. Steam-cooking, for dishes, and couscous. Frying in oil, often as a base for a variety of sauces.

Whatever the cooking period vary always and frequently from 2-to 3 hours over a high fire.

The fuels used are generally taken directly from nature. These are wood, charcoal, plant wastes (straw, millet stalks, corn cobs) or animal wastes (cow dung). Certainly, wood is the most used fuel but it is often combined with other energy sources.

In the first place, wood is used year round in the cities and in some parts of the departments of, whereas it is only used for part of the year in large areas of the city Centre combined with gaz, kerosine and electronic plate or plaque chauffante). Families either collect their wood directly from the countryside or purchase it. Direct collection is most widely practiced in the rural sector. It is usually done by women and children, and by men only in some villages.

The most common form of transport is by head load. A few highly privileged women have bicycles and carts, if the village is near the road as in Djalengo and Sanguere. Scarcity of wood which influences the travelling distance and the time devoted to the collection itself. It also depends on the family size, the individual woman's physical constitution and also the season, since there are periods -

especially from November to may - when women go wood-gathering every day and even twice a day to build up rainy season stocks to reserve for the rainy period (June to October).

In any case, wood represents a heavy share of the family budget. Millet stalks. Many women use millet stalks to light the fire or for all of their cooking. fuel requirements are wholly covered by millet stalks for many months, especially in the dry season in Pabla and Kismatari. Other plant and animal wastes besides millet stalks, cotton and sesame stalks are burned. Cow dung are used seven months out of twelve because the men are Fulani and Mbororo who are animal rearers.

As seen in Volta Noire it seems that cow dung is not used at all for preparing meals but is used for baking pottery. Millet stalks and cow dung are not sold. They are collected exclusively by women and children.

Kerosine, gaz and electronic are rarely found in rural areas, except in few families (working in administrative offices and richers) where coal is used just to make tea.

Improving and innovating propositions for the women in Benoue Division

Empowerment initiatives: Initiatives aim to support rural women, particularly through training projects, access to finance and support for entrepreneurship to strengthen their role in the development of their locality.

Historical marginalization: Despite their crucial role, women's work has long been under estimated and undervalued in statistics and development plan.

To contribute in solving the above climate related issues, RuWCED-Cameroon has in a series of capacity building workshops empowered some 55 women with skills on the production of clean charcoal within the context of a program on "complementary climate change mitigation and adaptation strategies". Charcoal pots produce less smoke which will significantly reduce the health effects of smoke in households. Also, the eco or green charcoal is environmentally friendly hence, will discourage deforestation and encourage recycling of waste into useful materials thereby reducing pollution. We also encourage the women to produce and commercialize eco charcoal.

Eco-charcoal is biodegradable and has a neutral environmental footprint. Therefore, it produces very little pollution and helps protect forests and biodiversity.

For example, 1 kg of eco-charcoal is equivalent to 5 kg of processed waste, 2 kg of wood, and 1 kg of conventional charcoal. This means that if 1 ton of eco-charcoal is used, 2 tons of wood and 1 ton of conventional charcoal are saved, and 5 tons of waste are recovered, while 3.7 tons of CO₂ are sequestered, according to the UNDP.

In terms of cooking energy, eco-charcoal is an ideal solution that allows low-income populations to cook their food without significant health or environmental risks.

It should be noted, again according to the same UNDP report, that 1 kg of eco-charcoal provides an average of 3 hours of cooking time with a Lower Heating Value (LHV) of 8.7 kWh/kg.

This value is higher than that of conventional charcoal (8 kWh/kg) and wood (3.5 kWh/kg).

In agriculture, eco-friendly charcoal can also be used for soil amendment, to combat water stress during the dry season, and as an insect repellent in smallholder farms.

Increasingly, the development of this sector can create new

markets and constitute a genuine income-generating activity for local populations. Consequently, it can contribute to reducing youth and women's unemployment.

Increasing access to energy is pivotal to fulfilling humanity's basic needs and enabling sustainable development. Yet the pace of progress has slowed, putting the 733 million people who still lack access at risk of being left further behind.

Goal 7 and the environment

Transitioning to clean energy is essential for reducing greenhouse gas emissions, improving air quality and mitigating the impacts of the triple planetary crisis of climate change, nature and biodiversity loss, and pollution and waste.

Ongoing conflicts, including in Ukraine, and global economic uncertainty continue to cause significant volatility in energy prices, prompting some countries to raise investments in renewables while others increase reliance on coal.

Some 2.3 billion people still cook with unsafe and polluting fuels, contributing to air pollution and worsening health impacts. Women and children are disproportionately affected. The combined effects of ambient and household air pollution lead to an estimated 7 million deaths each year and are linked with many diseases.

Our efforts towards contributing to reduce climate change vulnerability and households will receive the charcoal pots. The second phase is the production of cleaner cooking stoves locally called charcoal pots as done by these women (below) trained during the Bamenda crisis.



All the women who acquired the training were Internally Displaced Persons (IDPs), forced by the Anglophone crisis to settle in Bamenda. This means that they came from different communities in the region. The choice of IDP women was because they are the most vulnerable to the effects of smoke in the kitchen, climate change and most of them are breadwinners in their household due to the crisis in the region and the COVID-19 which has caused many men to lose their jobs. Also, women within our communities in general are the ones bearing the burden of going to the kitchen every day to cook for the family, especially using the fireside. First as IDPs, they need to either fetch for fuel wood or buy from the market. Given the untold hardship that the twin crisis of COVID-19 and conflict is imposing on communities as well as the fact that these women as IDPs have no community forests to fetch fuel wood from, public commons like watersheds in their host communities are taking the shot of all the stress and shocks.

LWF tackled the problem from two ends. Always working with refugees and hosts, LWF combined protection of the environment with the promotion of renewable energies. Since 2017, LWF has grown trees in nurseries and re-forested a total of 119 hectares. In addition, LWF distributes fruit trees to refugee and host community households, the administration of the camp, schools, mosques and churches.

Investing in more sustainable energy sources has also created livelihoods: 300 people work in the production of charcoal and stoves in the production centers, the majority of them women. Having their own income has and empowered them and improved their positions in the families. Since charcoal became the main source for fuel, women and girls are sent on fewer trips to collect firewood. And the young girls have more time available to study for school.

Conclusion

On the whole from the 100 women interviewed from the five villages, they prefer charcoal than wood because it makes rapid cooking without burning and does not need too much watching. Many of the women interviewed considered it the most economic fuel because, they said, "We don't have to watch the fire too much."

Millet stalks are appreciated by housewives because of the ashes from which they can make high-quality potash, used in all cooking soups, but they burn too quickly, require constant watching and give off a great deal of smoke. Cow dung has the same characteristics. Cooking with coal is considered too slow but this fuel has the advantage of being practically smokeless and of being sold retail. It can be bought for as little as F CFA 100 and 50. One housewife said that gas makes for quick cooking and is not tiring but she preferred wood (probably because of its price).

References

1. Ajala O. Livelihoods pattern of "Negede Weyto" Community in Lake Tana Shore, Bahir Dar Ethiopia. *Ethiopian Journal of Environmental Studies and Management*. 2008; 1(1):19-30.
2. Amadou S. Global Information Network. New York, Aug 16, 2002; 1.
3. Bailis R, Drigo R, Ghilardi A, Masera O. The carbon footprint of traditional woodfuels. *Nature Climate Change*. 2015; 5(3):266-272. Doi: 10.1038/nclimate2491
4. Bensch G, Peters J. Alleviating deforestation pressures? Impacts of improved stove dissemination on charcoal consumption in urban Senegal. *Land Economics*. 2013; 89(4):676.
5. Bryman A. *Samhällsvetenskapliga metoder*. Stockholm: Liber, 2011.
6. Chambers R, Conway G. Sustainable rural livelihoods: Practical concepts for the 21st century. IDS discussion paper 296, 1992.
7. Brighton IDS, Chikulo B. Gender, climate change and energy in South Africa: A review. *Gender & Behaviour*. 2014; 12(3):5957-5970.
8. Di Chiro G. Living environmentalisms: Coalition politics, social reproduction, and environmental justice, *Environmental Politics*. 2008; 17(2):276-298. Doi: 10.1080/09644010801936230
9. Gaudreau K, Gibson R. Sustainability assessment of the agricultural and energy systems of Senegal. *Energies*. 2015; 8(5):3503-3528. Doi: 10.3390/en8053503
10. Gherasim M, Tanase G. The fundamentals of sustainable development, *Contemporary Readings in Law and Social Justice*. 2012; 4(1):446-456.
11. Goebel A. Women and sustainability: What kind of theory do we need? *Canadian Woman Studies*. 2004; 23(1):77-84.
12. Harcourt W. Gender and sustainable livelihoods: Linking gendered experiences of environment, community and self. *Agriculture and Human Values*. 2016; 34(4):1007-1019. Doi: doi.org/10.1007/s10460-016-9757-5
13. Harcourt W, Nelson I. *Practicing feminist political ecologies: Moving beyond the green economy*. London: Zed Books, 2015.
14. Houweling E, Hall R, *et al.* The role of productive water use in women's livelihoods. Evidence from rural Senegal. *Water Alternatives*. 2012; 5(3):658-677.
15. Landguiden. Senegal, 2018. Retrieved May, 2019, from <https://www-uis.proxy.library.ju.se/landguiden/lander-och-omraden/afrika/senegal/>
16. Mohanty C. *Feminism utan gränser. Avkoloniserad teori, praktiserad solidaritet*. Stockholm: Tankekraft. 2006; 33.
17. Muzirikazi R. The role of women in the deforestation of Mugabe communal land in Masvingo district. Doctoral thesis, Bindura University, Science education, 2016.
18. Murren J, Esayas M. Program highlights plight of women in Africa, 2006.
19. Hanover PA, Said E. *Orientalism*. Stockholm: Ordfront, 1993.
20. Sola Paolo, Zhou Gautier, Iiyama, *et al.* The environmental, socioeconomic, and health impacts of woodfuel value chains in Sub-Saharan Africa: A systematic map. *Environmental Evidence*. 2017; 6(7). Doi: 10.1186/s13750-017-0082-2
21. Stacy J. Can there be a feminist ethnography? *Women's international studies forum*. 1988; 11:21-27.
22. Steady F. Women, climate change and liberation of Africa. *Race, gender & class*. 2014; 21(1-2):312-333.
23. Stock R. *Africa South of the Sahara*. New York: The Guilford Press, 2013.
24. UNESCO. Ile de Gorée, 2019. Retrieved June 12, 2019, from <https://whc.unesco.org/fr/list/26>
25. United Nations Development Programme. Application of the sustainable livelihoods framework in development projects. Guidance note. Panama City, 2017. Retrieved April 21, 2019, from https://www.undp.org/content/dam/rblac/docs/Research%20and%20Publications/Poverty%20Reduction/UNDP_RBLAC_Livelihoods%20Guidance%20Note_EN-210July2017.pdf
26. United Nations Development Programme. Gender inequality index, 2017. Retrieved April 21, 2019, from <http://hdr.undp.org/en/composite/GII>
27. United Nations Development Programme. Gender inequality index data, 2018. Retrieved April 21, 2019, from <http://hdr.undp.org/en/content/gender-inequality-index-gii>
28. United Nation. Sustainable development goals, n.d. Retrieved April 21, 2019, from <https://www.un.org/sustainabledevelopment/development-agenda/>
29. Unwomen. Women, health, and development, 2011. Retrieved May 19, 2019, from <http://www.unwomen.org/en/news/stories/2011/12/women-health-and-development>
30. WCED. *Our common future*, Oxford University Press: Oxford. (n.d.a.), 1987.
31. Worldometers. Senegal population, 2019. Retrieved May 7, 2019, from

<https://www.worldometers.info/world-population/senegal-population/>

32. Wurster K. Management matter? Effects of charcoal production management on woodland regeneration in Senegal. ProQuest Dissertations Publishing, 2010, 1-206.