

Women and household energy in Sahelian countries

A Boiling Point special supplement from PREDAS

This publication by the Programme for the Promotion of Household and Alternative Energy sources in the Sahel (PREDAS) is a summary of a series of surveys and analyses conducted in the Sahelian countries of Burkina Faso, Cape Verde, Mali, Niger, Senegal and Chad.

Covering a wide range of household energy related issues in the sub-region, the surveys were carried out based on a common framework but the choice of topics was left to the discretion of those coordinating the studies, and reflects the problems faced by women in each country.

Crucially, the surveys show the very real perceptions of Sahelian women active in the various segments of the household energy sector, especially in the consumption, processing, selling and income-generating activities associated with firewood, charcoal, LPG and coal.



“I was compelled to use firewood because I had no choice, this is the traditional source of energy available to me”, said a housewife in Niger. This situation is repeated for a great number of women in Sahelian countries – where firewood is the only viable cooking fuel.

Households are often limited in their choice of fuels by two key factors: fuel availability, i.e. a regular and accessible supply; and fuel affordability. In some particularly arid rural regions, poorer families are often forced to use alternative fuels such as cow dung, roots, rags and plastic. Across the Sahelian countries surveyed, wood was the most commonly used and cheapest of energy sources, although people are increasingly switching to other fuels.

The processing and selling of wood and charcoal can also provide a much needed income. Mrs Oumou, one of the many women surveyed, puts it in the following words, “Here, we have problems. There is no profitable activity. This is the only means for women in this area to scrape a living. It is a very hard work but it brings money.”

The findings of the surveys were varied and in Mali, Burkina Faso, Niger, and Chad they highlighted the use and sale of firewood and charcoal. In Senegal, they concentrated on charcoal and LPG, while those in Cape Verde underlined the use of LPG and firewood. In Niger it was the issue of (mineral) coal as an alternative to firewood, in Mali the use of blended coal/biomass fuels, and in Mauritania the popular fuels were charcoal and LPG and to a lesser extent firewood.

1 euro = 656 FCFA

The Franc Communauté Financière Africaine (FCFA) is a currency used in many West African countries that has an exchange rate fixed to the euro.



Figure 1: Mrs Yaro Alibi cutting live wood with permission from local forestry officials in Burkina Faso. Many women are now entering this line of business, which used to be completely dominated by men. (Photo: PREDAS)

Firewood: The most widespread and cheapest of fuels

Women in the woodcutting business

“An axe, a donkey, a water bottle and a meal - these are my tools whenever I go into the bush”, explains Mrs Oumou, a female woodcutter from the village of Kasséla in Mali. She cuts wood and takes it to the rural market at the rate of one cart-load a week. Equipped with a woodcutting permit, obtained by paying a weekly tax of 2,000 FCFA, Oumou is aware that she does not have the right to cut live wood and that she must work within the areas demarcated for exploitation. Being a female woodcutter is not an easy job but it does enable her to earn a sufficient income.

Fuelwood collectors often have to travel long distances between the forest and the village, carrying heavy loads on their heads and can suffer from pains and even heart palpitations. There is also the risk of injury from axes, tree stumps, snake-bites and poisonous insects.

To be a woodcutter in Burkina Faso, you must belong to a forest management association. Mrs Yaro Alibi of Dana village in the Midwest region of Burkina Faso explains why she started woodcutting, “Before I started with this activity, I was selling doughnuts on market days and local (millet) beer every now and then...I earn more money now and I can afford to buy cooking utensils. I also help my husband to buy food supplies during the lean period”. She continues, “I engage in this activity in order to provide for my personal needs, for the education of my children, their upkeep and their health. As a community duty, I have contributed to the construction of our village school”.

According to Oumou, the advantage of this trade “is that you can engage in this activity irrespective of your financial condition and it does not require business capital like other activities. Also, the money earned from this trade is an asset. For example with two cart-loads in a week, I can earn at most 5,000 FCFA and at least 3,500 or 4,000 FCFA.”

Woodcutting - an appropriate activity for a woman?

Woodcutting is traditionally an activity carried out by younger men as it requires strength. The more muscular physique that results from this occupation leads many to think it an undesirable activity for a woman.

However, these viewpoints are becoming increasingly obsolete since forest management activities first started in Sahelian countries about twenty years ago. Both Oumou and Alibi started to harvest and sell wood from the managed forests in order to provide for their needs. “Since I started this activity I became more financially independent”, Alibi reports, “In the village our essential needs include food, our children’s education and a little money to cater for social events. One is full of joy, when you are able to achieve this”, she says. *Armande Sawadogo*



Figure 2: Mrs Diarra Massira Traore, a wood retailer in Mali. (Photo: PREDAS)

Figure 3: Mrs Akhaye Harouna of Midekhine village in Chad prepares bundles of wood. (Photo: PREDAS)



Rural communities and forest management

In Burkina Faso, the cutting of wood is carried out by legally recognised forest management associations. Men and women are mobilised and trained for this work, with the aim of sustainable village forest management and income generation for the riparian (river bank) communities. It is illegal to cut wood outside the demarcated area as well beyond the time period indicated by forestry guards who supervise the activity.

In *Mali*, a permit from the forestry department is needed before cutting wood otherwise you can be liable to a heavy fine. Mrs Oumou warns “if you exploit a protected area and you are caught by forest guards, you will have problems”.

In *Burkina Faso*, there are scheduled periods for the cutting of live wood (January to March) that is then dried and later sold to carrier-wholesalers. In Cape Verde, the roadside sale of firewood is illegal and subject to confiscation by the local police. However, this activity still occurs in a few villages because, according to one women firewood seller (and almost certainly a woodcutter), the required permit is only valid for three months, an insufficient period of time in which to make a living. They are therefore forced to take the risk of cutting wood from public forests without permits for the remainder of the year.

In *Cape Verde*, wood is the fuel of the poor. Mrs Nela is an elderly woman who has been using wood and charcoal and remembers when forests were abundant in the archipelago. On the property that she owns, she allows poor women to cut wood that they then use for cooking and also sell to earn an income. “These women cannot afford to buy gas”, she said.

The sale of woodfuel in rural areas is a recent phenomenon as it used to be possible for people to collect sufficient quantities of twigs and small branches from the vicinity of their houses. Today, wood is harvested and sold even in rural areas and it represents an important source of income for women. Alibi, the Burkinabe woodcutter, says that she sells wood along the road for 100 FCFA per bundle.

In *Mali*, Diarra Massira Traoré of the Kasséla village is supplied with wood from the managed forest of Faya, which she then sells on to customers. Massira is one of 40 women who belong to a woodcutting association. She, like her colleagues, needs to pay a tax of 2,000 FCFA in order to sell wood. The association works closely with the rural market operators of Kasséla within the framework of the local management committee.

In all the Sahelain countries surveyed, it was noticeable that commercial networks for the collection, transportation and distribution of wood are in operation. This was especially so in Mauritania, where the phenomenon is of extra concern as it is taking place in the river and forestry-pasture zones, so competing with the traditional firewood gathering practises of local populations.

Yes to desertification control, but we need to survive!

As a result of awareness campaigns being carried out by the media, as part of measures to combat desertification in the region, people appreciate the need to use wood supplies sustainably. According to Alibi from Burkina Faso, “woodcutting enables the village community and the nation to regulate the cutting of live wood and allows the forest to regenerate”.

Angelina, a firewood seller from a village in Cape Verde, says that she “is aware that the country is endowed with little environmental resources but we have to survive one way or the other, especially when one has a family to look after.” The unregulated cutting of wood is banned in Cape Verde, even on private lands. However, wood can be cut using hand tools from March to June but only to prepare lands in the irrigated areas used for cultivation. More than 600 forest guards and about ten policemen supervise the wood exploitation business in the islands.

Women interviewed in *Niger* believe that the use of other sources of energy, such as coal and LPG, would contribute to the reduction in excessive firewood use and so preserve the environment.

Why do women sell wood?

There are many reasons why women choose wood selling as a business activity. In *Niger*, Mrs Madina Mamane explains, “At first I was selling only doughnuts but I realised that this activity could not adequately provide for the needs of my family. Therefore, in order to extend my opportunities, I started a wood selling business using a loan of 100,000 FCFA that I obtained from our women’s association”. In *Burkina Faso*, Florence says that she “could not sit there doing nothing in Ouagadougou. At first, I was selling cola nuts and later changed to the sale of wood and charcoal as it is more profitable”. Tigane Badjé Fofana of *Mali* has been selling wood for the past 13 years and since it is profitable she does not want to stop. She started by selling small bundles of firewood and later obtained a loan from a savings bank that enabled her to buy in larger quantities.

Many women make substantial profits in the wood business. In *Chad*, Mrs Akhaye Harouna of Midekhine village says she can buy a stack for 50 FCFA and resell for 100 FCFA. In Ouagadougou, Florence makes about a 10% profit on a cart-load of wood worth 15,000 FCFA. When she buys more significant amounts from a carrier-wholesaler, she can make 40,000 FCFA profit in a month.

According to Badjé, “everything depends on the market. On a good day, especially during the rainy season, I can earn between 15,000 and 25,000 FCFA but on other days this can be much lower”. With the profits derived from this activity, Florence says that she can feed her family and is also able to meet expenses connected to social events such as naming ceremonies, marriages and funerals. Her family make use of bark and small pieces of wood for fuel as these products cannot be sold. For Akhaye in Chad, it would be difficult to live without the profits from her wood business. “I have to confess that I am trying to survive with the little I earn from the business. This enables me to provide for the daily needs of my family. The money I receive from my husband is not enough, because we have a big family of 13 people”, she stated. For Madina, it is her family’s living standard that has greatly improved, “I look after four children and I have registered them in a local private school in order to ensure a bright future for them”. Badje says, “the profit I make enables me to provide for my needs whether they are personal or related to the family or community. I don’t know my profit as such, but I am able to pay my contribution to the tontine fund(an informal saving/credit association widely used in West Africa) and meet my daily expenses.”

The woodfuel supply chain

The retail sale of firewood is an activity almost exclusive carried out by women, especially so in urban centres. They are generally supplied by carrier-wholesalers who transport the wood from the forest using trucks or carts drawn by donkeys.

In Chad, “we are supplied by wholesalers. They travel hundreds of kilometres into the bush to cut dead wood or at times live wood, which is then dried and sold to us”, says Akhayé. Badjé, a wood and charcoal seller in Bamako, Mali, travels to the forest with the truck drivers so that she can buy at a lower price. She also buys wood from carrier-wholesalers. In Niger, Mrs Madina Mamane is registered with a truck owner working in the wood business who brings supplies to her home.

So for many of the women firewood retailers, there is no need to travel in order to get their supplies. In Burkina Faso this fact is reflected by Florence who says “the selling of wood does not require any movement, in as much as the carrier-wholesalers do the supply, and the door-to-door woodworkers cut the big logs into small pieces that can be used immediately”.

Woodfuel supplies can vary throughout the year and Madina says that in Niger, during the wet season, “wood is scarce and very costly. Most of the trucks are in bad state and do not have access to forest areas whenever it rains heavily.” According to Badje of Mali, wood is very expensive in the rainy and cold seasons. For Florence in Burkina Faso it is “during the rainy season that it is difficult to get supplies of wood due to the condition of access roads in the forests. People are also occupied all the time with farming and can no longer engage



Figure 4: A women firewood seller stands in front of her stock. (Photo: PREDAS)

Figure 5: Juliette arranges her fuelwood in small bundles in Burkina Faso. (Photo: PREDAS)

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in the wood business. The wood loading prices are very high”. Florence noted that she would have less supply problems if she had sufficient money to stock wood during the dry season. Unfortunately for Madina, “the lower the supply of wood, the more the price increases”.

Firewood and taxation

In Burkina Faso, for example, the price of wood is fixed by the Ministry of the Environment and this price has not changed for the last twenty years. A stère of wood (one cubic metre of stacked wood, including spaces) is sold at 2,000 FCFA to carrier-wholesalers.

Akhayé Harouna of N’djamena, Chad, buys wood by the stère from local villages and says that a stack of wood, comprised of 6 pieces and weighing about 2 kg, is sold for about 50 FCFA, but that the price can vary from one area to another. She also buys wood from carrier-wholesalers. The firewood is then cut and resold in smaller bundles with the price determined by the type of customer: from housewives who buy smaller quantities of wood; through to bakers, brewers, meat roasters etc. who require much larger volumes. Taxes related to the sale of wood can be a considerable burden. Harouna says that taxes are her major concern, “I only resell and so I am carrying a double burden. First, wholesalers increase the price of wood because they pay a high tax to the forestry authority, and then I also pay a tax of 2,000 FCFA on a weekly market day”.

In Niger, on the other hand, Madina finds the taxes affordable, “as retailers, we pay 150 FCFA per month, but truck owners pay about 3,000 FCFA tax for every trip”.



Why do women use wood as a cooking fuel?

Firewood is the most commonly used fuel in Sahelian countries and is seen by women as the cheapest source of energy available to them. However, this perception may not necessarily reflect the results of a more rigorous economic analysis.

Wood is available in small quantities and for the very poor twigs, bark and other small pieces of wood can be used to meet daily cooking fuel needs. Aïchatou Aboubacar of Niger is of the opinion that “wood cannot be said to be the ideal fuel but it is most accessible. Wood can even be bought at 50 FCFA, much less than other types of fuel”.

Cooking during social events is mostly done with wood and a three stone fire as this allows for the use of larger pot sizes. Woodfuel is also used when preparing medicinal plants and some special dishes. As a by-product of burning wood, charcoal is produced which can be used as a fuel at a later date.

One of the major disadvantages of using wood as a fuel is the emissions that are produced by often inefficient stoves or fireplaces. Walls and pots are blackened, food and clothing are tainted by smells and, most critically, the health of women and young children are put at risk. Wood is also not very suitable for urban use, where supply and storage issues as well as emissions can create problems in densely populated areas.

During the rainy season wood can prove difficult to light and the supply chain can be disrupted by the inaccessibility of many roads. According to Kaltouma, “the use of wood is not an easy task. After lighting the fire, one needs to fan it for a long time before obtaining some glowing embers. This means that cooking food can be a slow process, a housewife must be patient. It gets worse during the rainy season when a lot of energy has to be exerted in order to fan the fire whenever wood is wet.”

Fuel use in Mauritania

The most widely used household cooking fuel in Burkina Faso, Mali, Niger and Chad is wood, with charcoal being the most popular in Senegal and Mauritania.

In the main urban centres of Mauritania, some 43% of households use charcoal as their main cooking fuel, with most of the remainder using it as a supplementary fuel. This consumption pattern has had a knock on effect in encouraging charcoal use in secondary towns and also in some rural areas. LPG is also used by 37% of urban households as their main cooking fuel, although this figure reduces at the national level. However, some 20% of rural household also use LPG and nationwide the use of this fuel is increasing. Firewood consumption is declining in urban centres (19%), but is comparable to charcoal in rural areas (32%) where it competes with LPG as supplementary fuel.

PREDAS Mauritania survey

Wood and women’s health

The normal cooking practice in Sahelian countries is to prepare meals inside cramped and badly ventilated kitchens, using fuels such as wood, cow dung, charcoal and crop residues on a rudimentary three stone fire. This is a daily reality for most women, especially in rural areas, which exposes them to potentially harmful levels of smoke and particulates. The cooking of meals outside is not a preferred option, due to wandering animals, the risk of burns to playing children, the effect of wind on burning wood etc.

When cooking, women often complain of respiratory problems, headaches and eye pains. Those with babies (up to 1.5 to 2 years old) carry them on their backs, so exposing their infants to the same damaging health impacts and putting them at increased risk of serious respiratory infections. In very poor households, some women are forced to use roots, plastic or rags as cooking fuels, the emissions from which are thought to further increase the risk of respiratory illness.

To date, there is a lack of studies on the effects of indoor air pollution on the health of women and children in Sahelian countries.

Juliette of *Burkina Faso* lists the disadvantages associated with the use of wood as “lots of smoke, very messy because of the soot and the bad odours that change the taste of meals”. In addition she says that the use of wood causes “eye irritation, respiratory problems, sweating and running nose, which results in coughs, sneezing, colds and tears in my eyes. Children feel uncomfortable and they cry while rubbing their eyes and nose against their mother’s back. They cannot breathe easily and they cough”. Aïchatou Aboubacar in *Niger* says, “it may happen that dry wood may not be available in the rainy season or when it rains, in this case smoke is released and this can be harmful to health”. However, in many cases the women do not establish a direct link between indoor air pollution and respiratory infections.

Women are exposed to smoke throughout their lives, as they start cooking from about the age of eight and continue right through until they retire. Mrs Kaltouma Kabo of N’djamena in *Chad* says, “obviously the use of wood is not without consequence. The first victim is the housewife herself. The smoke released by firewood is harmful to the eyes, my eyes water continuously while I am cooking.”

Outdoor air pollution

Another important factor is outdoor air pollution. Analysis of firewood use shows that the fuel can contain a significant quantity of pollutants, the concentrations of which are used by many countries in specifying outdoor air quality standards. Emissions include carbon monoxide, hydrocarbons and nitrogen oxides, with many organic components like benzene, formaldehyde and aromatic polyamines being considered as toxic or carcinogenic.

Mireille Ehemba

Charcoal: An urban fuel

Charcoal is predominantly an urban fuel in Sahelian countries that has increased in popularity with the growth of many cities. In Mauritania, it is the most commonly used fuel, especially in the urban centres.

For many households, the fuel represents a more practical source of energy than wood as it is cleaner and easier to use, as well as being cheaper to transport from forest to town (due to its higher energy density). The fuel is also well matched to the culinary traditions of many Sahelian countries, where the slow-cooking or simmering of some dishes, roasting of meat and fish etc is popular. Assitan of Mali would not use firewood if her financial position was better, she says that “the advantage of charcoal lies in the fact that it does not produce smoke like wood.”

However, the growth in charcoal consumption has also accelerated deforestation in many areas due to often inefficient production processes requiring 5 to 8 kilograms of wood for every kilogram of charcoal.

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I manage to sell about fifteen bags of charcoal every week... Thank God, this enables me to pull through.

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Figure 6: Mrs Alima Sacko packs charcoal into bags in Kassela, Mali. She produces between 10 to 15 big bags of charcoal every week and sells each one for around 3,000 FCFA. (Photo: PREDAS)



Charcoal and wealth creation

In Senegal the production of charcoal is mostly carried out by forest agencies approved by the Ministry for Water Resources and Forestry. These agencies control the entire charcoal network from the production through to retail stages, and are normally managed by men. The retailers (‘diallos keurigne’) are responsible for the distribution of charcoal, which they sell in charcoal parks located around the city districts, particularly in the suburbs. Nevertheless, it has been noted that women are becoming more involved in the charcoal supply chain in both a seasonal and full time capacity. Their work enables them to earn money and so provide for their families, in terms of school fees, the purchase of food and fuel, health costs, social events etc. When interviewed, the women said that their incomes allow them to survive, as they are often heads of family or living in polygamous homes, where rivalries can mean that their husbands do not provide sufficient support for them or their children.

In both Senegal and Niger, women charcoal traders were paying into a tontine fund, where they typically made daily deposits of between 100-1000 FCFA which they then receive back at the end of the month. This regular form of income provides a useful addition to the daily profits from their charcoal selling activities. In Burkina Faso, women pack charcoal into bags which they then sell for 50 to 100 FCFA, ending up with a net profit of between 1,500 and 2,000 FCFA per day.

Figure 7: Juliette makes piles of charcoal for sale in Burkina Faso. (Photo: PREDAS)



In *Chad*, Mrs Am-Rakhie of the Kourmari village said, “I resell a bag of charcoal for 3,000 FCFA of which 250 FCFA is paid to the forestry authority as tax, leaving me with a profit of 750 FCFA. I manage to sell about fifteen bags of charcoal every week, from which I earn approximately 45,000 FCFA of profit a month. Thank God, this enables me to pull through.”

Mrs Ache declares that, “At the beginning, I started this trade with about ten bags. As I am speaking to you, I have got about forty bags, which proves that my trade is flourishing year after year. When I started in this business twenty years ago a bag of charcoal was sold for 2,500 FCFA. Today the price varies between 6,000 and 7,500 FCFA.” She goes on to say, “I noticed that as festivals approach, the demands of my customers tend to exceed my capacity. At times I sell up to 60 bags in a week. This forces me to borrow some bags of charcoal from my colleagues in other areas. The market evolves but to the detriment of the poor. The price of a bag is not within everyone’s means.” She adds, “the use of charcoal still persists in the mentality of Chadian women. It is true that some of them use gas, but their proportion is low. Charcoal is still up-and-coming in Chad, therefore us women engaged in the charcoal trade don’t complain.”

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The problems of working with charcoal

In working with charcoal, women face numerous problems. The bags contain a lot of dust, which is both unsellable and also harmful to health, with women drinking milk in the evenings to help clear their respiratory tract. In the market place, charcoal sellers often don’t have a permanent stall and other traders object to their presence due to the dust that they generate. At a social level it can be deemed undesirable for woman to be working in the charcoal trade, but in the opinion of the women themselves aesthetics is not very important, it is a matter of income generation, therefore they will continue to fight in order to ensure that they are respected in the market and have a stable selling place.

In *Chad*, Am-Rakhie responds, “the price of charcoal is high. I buy a bag that weighs 25 to 30 kg at 2,000 FCFA from the wholesaler. The price fluctuates according to the season, during the rains it doubles or even triples. In the month of August especially, the buying of charcoal is more difficult. It is not within the reach of retailers because the prices are high”.

Women charcoal producers

Charcoal production is an activity almost exclusively reserved for men, with women being responsible for it’s retail. However, woman charcoal makers can be found in Kassela, Mali, due to this being one of the only income generating activities available to them in the area.

Alima Sacko is 46 years old and has been working in the charcoal trade for the past 15 years. Alima buys wood from the carrier-wholesalers who operate in the managed forests, and she produces between 10 to 15 big bags of charcoal every week, which sell for an average of 3,000 FCFA per bag.

For the past two years, Alima has been using a new carbonization technique that reduced the production time from one week down to 2-4 days. Unfortunately she has since reverted back to the traditional charcoal kilns as “the new technology is profitable but each batch requires a large quantity of wood which I cannot afford due to a lack of capital”. Her working equipment is basic, a barrel and two shovels, and Alima says that she is tired of this work and if she had a choice she would give it up.

Niare Boudua Konte

Figure 8: Mrs Am-Rakhie sorts charcoal in Kourmari village, Sub-prefecture of Koundoul, Chad. “I manage to sell about fifteen bags of charcoal every week. Thank God, this enables me to pull through” she says. (Photo: PREDAS)

LPG: A convenient fuel

In Sahelian countries, Liquefied Petroleum Gas (LPG) can be considered as a fuel at the top of the 'energy ladder'. Electricity is also used for cooking but this is an expensive option and so accessible to only the rich.

In many countries such as *Senegal, Mauritania, The Gambia* and *Cape Verde*, governments have carried out the policy of mass LPG promotion for many years, with the aim of reducing human impact on the local environment.

However, due to both availability and price issues the fuel has yet to be widely adopted across the region.



Is LPG cheaper than charcoal?

The price of LPG is a limiting factor to its widespread use but in urban areas, where family sizes are decreasing, it can offer a cheaper alternative to charcoal.

In *Senegal*, LPG supplies are becoming more intermittent and prices are rising. The most popular sized 6kg cylinder costs around 2,000 FCFA and lasts for an average of ten days, when just used for cooking breakfast and lunch for a family of 6 to 8 people. However, for many women LPG is still a more economical choice than charcoal. When preparing a typical midday meal they can use between 2 to 3 kg of charcoal, at a cost of 200 FCFA per kg, and when making millet couscous between 3 and 4 kg. According to the women interviewed, the advantage of charcoal is that it can be sold in smaller quantities and used whenever LPG supplies run out.

Mireille Ehemb

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Each family should try to use LPG in order to prevent women from becoming slaves in their own kitchens, a place where they can spend many hours a day cooking meals.

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Figure 9: Miss Khadidiatou Dia says, “I have been using LPG for more than 5 years. I prefer it to charcoal”. (Photo: PREDAS)

The benefits and drawbacks of LPG

In *Burkina Faso*, *Mali* and *Niger*, vast awareness campaigns have been used to promote LPG consumption. By highlighting the fuels environmental and domestic benefits, this policy has shown some positive external effects. Women using the fuel say that they appreciate its speed and cleanliness as well as the reductions it offers in fuelwood collection efforts and, more especially, health impacts. According to Mrs Dona Nela of *Cape Verde*, “each family should try to use LPG in order to prevent women from becoming slaves in their own kitchens, a place where they can spend many hours a day cooking meals.”

In *Niger*, Maïmouna Ousmane works in a small town located about a hundred kilometres from Niamey, the capital city. She uses LPG as her main domestic fuel and is of the view that “cooking with gas is faster and cleaner. With LPG I can quickly cook something and eat at any time, which is difficult to do with wood or charcoal”. She goes on to say, “there is a big difference between the use of wood and gas. First, cooking with gas does not produce smoke. It is also faster and your dresses and pots remain neat and it is more convenient to use than wood. LPG also helps with the fight against deforestation”. Irene Miranda Tavares, a women who sells gas cylinders in *Cape Verde*, says that the use of LPG is on the increase and that “women should make efforts to use gas because wood is scarce on the islands and the little that is available must be preserved. With the use of gas, the walls of the kitchen are no longer blackened and time can be saved in order to engage in other activities, particularly those that generate incomes.”

However, Maïmouna also complains that, “I have a big problem with supplies as when my gas cylinder is empty I may have to wait days before I can get it refilled. Gas can also be dangerous and must be handled very carefully. An undetected leak can cause damage and be harmful to one’s health”. She goes on to say, “Gas, according to my neighbours, is a luxurious product and you must have the financial means to be able to use it regularly. With the recent increase in the price of gas, one must be determined if you want to continue using it.” In *Cape Verde*, although LPG is a popular cooking fuel, many poorer households cannot afford to use it.

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The mixed results of LPG promotion in Mauritania.

Efforts to substitute the use of biomass with LPG in Mauritania first began in the late 1980’s and was focussed on Nouakchott and the arid zone. The dissemination of the new fuel then rapidly spread to more rural areas, and this was achieved with almost no financial incentives from public authorities. There were, however, some problems:

After the devaluation of the local currency in 1994, the import price of LPG increased. This then resulted in a reduction in the number of households switching to LPG as charcoal was price competitive in many urban areas.

The stock of LPG cylinders in the country was old and limited in number, contributing to the lack of growth in the market.

Local cooking habits continued to present a barrier to the further uptake of LPG. For instance, festive meals (marriages, naming ceremonies, etc.) are never prepared with gas - firewood is always preferred.

Study carried out by PREDAS Mauritania



Figure 10: Although not a focal country of CILSS/PREDAS, in neighbouring Sudan a women cooks on an LPG stove in Kadugli, a camp for displaced and marginalised people on the outskirts of Kassala. (Photo: Liz Bates/Practical Action)

Household fuels: Perceptions and culture

Firewood is the most commonly used fuel in Sahelian countries and is seen by women as the cheapest available fuel, for many it is the only available fuel. Where forestry resources are sufficient, firewood has no monetary cost as it can be collected for free, and where supplies are limited, wood is traded but still represents the lowest cost fuel. It is an accessible and affordable fuel, as it can be bought in small quantities and used on a simple three stone fire, and suited to a wide variety of cooking tasks (simmering, roasting, social occasions). Wood is, however, a dirty fuel that is not particularly suitable for urban use. Smoke blackens walls and pots, food and clothing are tainted by smells, and women and children suffer from a range of health issues, from stinging eyes through to major respiratory infections.

Charcoal is a convenient and relatively clean fuel to use that has been widely adopted in the urban areas of many Sahelian countries. Other advantages of the fuel include the ability to purchase it in smaller quantities, as well as it being well matched to the culinary traditions of the region i.e. roasting meat and fish. However, it is a more expensive option than wood and the production and processing of charcoal results in environmental damage and dust, which is messy and harmful to health.

LPG offers women a modern, fast and user-friendly way of cooking but its high costs, both upfront and running, make it unaffordable to most. In addition, the stove/fuel combination can have safety issues (i.e. manipulation, damaged cylinders) and are not suited to the larger pots used for social events.

Multiple fuel use, a necessary strategy

It is unusual to see Sahelian housewives use just one type of cooking fuel. Instead they adopt a multiple fuel use strategy that allows them to better cope with their daily needs and resources (i.e. culinary habits and fluctuations in income, fuel price and availability, family size etc). In theory, as a household's income rises they will move up the 'energy ladder' by adopting cleaner, more modern types of fuels and stoves. This energy transition process can be seen in the urban areas of many Sahelian countries where households are switching from using wood to charcoal, and also charcoal to LPG.

In *Mauritania*, most urban and rural households have adopted similar eating habits. Rice is cooked for lunch, couscous at dinner and mint tea is drunk in the afternoon. Each activity requires a lengthy cooking time but the preferred fuel for each task varies.

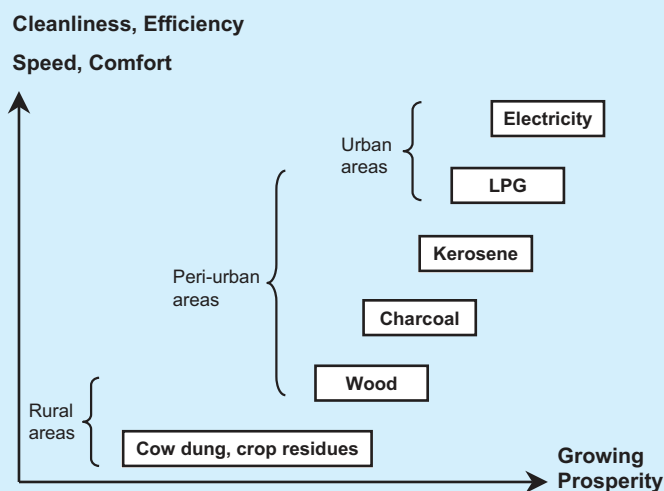
For the cooking of rice women favour charcoal to LPG, even if they are sold at the same price. Conversely, for the preparation of couscous, firewood is preferred. For a dish where rice and sauce have to be cooked in parallel, a combination of fuels/stoves might be used. The sauce, which requires a longer cooking time, would be made on a charcoal stove while rice would be prepared on the higher cost LPG stove.

This highlights the fact that in addition to affordability issues there is a cultural dimension to the use of cooking fuels.

In *Niger*, coal is processed into a household fuel by small-scale industry. Maimouna Ousmane says, "I heard about the (mineral) coal at a ceremony where women used it to cook a meal. I liked it and I have been using it ever since, but only on the weekends as it's a bit difficult to light."

In *Mali*, Mrs Nogaye M'Baye uses a mixed biomass/coal fuel to cook meals and thinks that this heats up much faster than charcoal. She says, "the energy production of the new coal is very significant compared to charcoal, because after a day's cooking the embers left over in the stove are reused the next day to start preparing another meal. The disadvantage of this coal lies in the fact that once it is lit you cannot put it out, which you can do with charcoal."

Figure 11: The 'energy ladder': cooking fuels used by households in Senegal.



“
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”

“
Owing to the platform, we
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”

The multi-functional platform and income generation

In *Burkina Faso*, *Mali* and *Senegal* there are some national poverty reduction programmes aimed at developing multi-functional platforms (MFP). Designed especially for rural areas, the multi-functional platform is a series of machines that are driven by a diesel engine (using diesel, biofuels or biogas) and used for the processing of cereals and production of electricity at the village level. The mechanical energy can be used for milling, grinding, hulling, etc. or transformed into electrical energy by a generator, which produces electricity for domestic as well as small scale enterprise (electric lighting, welding, carpentry tools etc). This can also be used to pump water from a borehole into the village.

In using an MFP, the burden of household tasks can be reduced and the time saved can be used by women for income generating activities, and the outputs of this directed to other initiatives such as the purchase of improved cook stoves, forestry training/management. Salamata, a user of an MFP in one of the 8,000 villages in *Burkina Faso* tells us that “thanks to the platform, we no longer need to travel for milling and grinding shea butter and groundnuts, charging of telephone batteries and lighting. The time gained enables us to work more effectively in the farms and to make and sell soumbala” (a condiment/seasoning made from the fermented seeds of the Néré tree). She goes on to say, “my profit from soumbala has allowed me to do two things: increase my production and sales of soumbala; and to earn more money, between 6,000 and 15,000 FCFA every month, which I use to take proper care of my children and to improve the quality of food by buying more ingredients like dry fish and rice.”

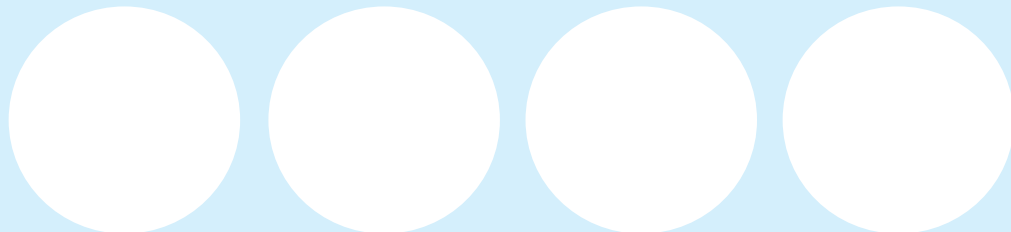
Figure 12 A multi-functional platform that runs on diesel or liquid biofuels, and can be used for maize milling as well as electricity production. (Photo: PREDAS)



Future policies

In Sahelian countries, urban areas are consuming large quantities of biomass sourced energy and so the regulation of the woodcutting industry is an important issue. Over the coming years it is necessary to follow a number of complementary actions:

1. The continuation of activities that promote the sustainable use of firewood and charcoal in both urban and rural areas by: Vigorously continuing the promotion of sustainable forest management by the people themselves. In empowering local communities with increased responsibilities, with respect to the regulation of firewood cutting, they will be committed to the protection of their natural resource. Moreover, they can derive significant incomes from the sale of firewood and charcoal and are therefore motivated to protect the source of their livelihoods. Evidence for the successful implementation of this approach can be seen in both Mali and Burkina Faso, where people are sustainably harvesting wood through their involvement with forest management associations. Reintroducing and encouraging the use of improved stoves designed for wood and charcoal use. Improved stoves are an important component of the overall strategy as they represent a simple and effective technology that is within the reach of an average Sahelian household. Consumers are already aware of the existing energy efficient models and new dissemination programmes need to be put in place.
2. The development of (mineral) coal as a household fuel in Niger and possibly Mali, where it could be blended with biomass. In addition a supply network could be established to distribute the fuel to other Sahelian countries which, together with stove manufacturing, would create employment for many. Coal fits the culinary needs of many households and also offers reduced cooking times, lower fuel costs and eases pressure on local forestry.
3. The continued promotion of LPG, especially in urban centres where uptake is increasing. Also, the development of LPG stoves/burners that better match the cooking requirements of Sahelian households.
4. Additional social scientific and technical research into other household stoves and fuels, such as kerosene and solar cookers.
5. The development of markets for biomass briquettes made from agricultural residues (cotton stems, rice husks, peanut shells etc).



CILSS: Regional cooperation for the sustainable development of the Sahel

The Permanent Inter-state Committee for Drought control in the Sahel (CILSS) was set up in 1973 and it is comprised of nine member countries: Burkina Faso, Cape Verde, The Gambia, Guinea Bissau, Mali, Mauritania, Niger, Senegal and Chad. CILSS is governed by two organisations - the 'Summit of Heads of State or Government' and the 'Council of Ministers' - that set policy guidelines and make decisions based on the wishes of its member states.

The 'Programme for the Promotion of Household and Alternative Energy sources in the Sahel' (PREDAS) is a CILSS initiative implemented with support from the European Union and the Federal Republic of Germany. Its overall objectives are to contribute to the sustainable management of natural resources in the region, as well as poverty reduction through the supply of low cost household energy.

The aim of this publication is to show the role of women in the supply of household energy in Sahelian countries. The report, coordinated by Smail Khennas and Elhadji Mahamane Mahamane Lawali, was written by Mrs Armande Sawadogo and is based on the findings of a series of surveys carried out by:

- Mrs Armande Sawadogo, Burkina Faso
- Mrs Pereira De Barros, Cape Verde
- Mrs Niare Boudia Konte, Mali
- Mrs Issouffou Aïchatou Illou, Niger
- Mrs Mireille Ehenba, Senegal
- Mrs Raïssa Kassire Coumakoye, Chad
- In Mauritania, the survey was carried out by a consulting firm

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www.hedon.info/QXPA

- * Visit the PREDAS website
- * Energia news article 'Women and the supply side of energy in Sahelian countries'
- * Economic Community Of West African States (ECOWAS) website
- * The West African Economic and Monetary Union (WAEMU) website

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