



## Women and the energy crisis in the Sahel

Jacqueline Ki-Zerbo

**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!**

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The Sahelians rarely eat uncooked food. Most dishes are subject to lengthy cooking, probably imposed by the nature of the food itself but also by the need to destroy germs and parasites.

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 like "dégué" and couscous.
- Frying in oil, often as a base for a variety of sauces.

Whatever the cooking method, one must always calculate at least 30-45 minutes and frequently 2-3 hours - of processing 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).

**Wood.** Certainly, wood is the most used fuel in the Sahel but it is often combined with other energy sources and in particular ways, as we shall see.

In the first place, wood is used year round in the cities and in some parts of the departments of the Centre, Centre-nord and Volta Noire, whereas it is only used for part of the year in large areas of the Centre-nord and the Sahel. 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, such as Bambofa, Malbo, Mamassiol and Kampiti. Whether this is wood collected by men for their wives or as chores performed for other families has not been established.

The most common form of transport is by head load. A few highly privileged women have bicycles and carts, especially in Upper Volta and the Kongoussi. The workload depends on the supply or 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 May and June - when women go wood-gathering every day and even twice a day to build up winter stocks.

In the cities and in some villages women buy all or part of their wood. Like the cost of physical effort, financial cost also varies. Housewives pay F CFA 2000-2500 for a cartload of wood in Dédougou and Kongoussi, F CFA 3000-5000, depending on the load, at Ouagadougou and F CFA 400-600 at Banbofa. To these prices, wood-cutting costs (F CFA 500-600 per cart-load at Dédougou and Ouagadougou) and the winter seasonal increases must be added. A cartload lasts approximately one to three months, depending on the size of the family and the housewife's skill at saving. Monthly expenditures set aside for wood come to approximately F CFA 450 at Kombissiri, F CFA 500-800 at Cissin (Ouagadougou), F CFA 4000 at Kalgondin (Ouagadougou), and even F CFA 9000 for a large family living in the Ouagadougou pilot area. In the Sahel those monthly expenditures are of the order of F CFA 560 at Bouloye and F CFA 280 at Malbo and at Mamassiol. These paradoxically low figures can only be explained by the combined use of wood and other fuels.

In any case, wood represents a heavy share of the family budget. A wage-earner supporting a large family at Ouagadougou spends one third of his monthly salary on fuelwood alone.

**Millet stalks.** Many women use millet stalks to light the fire or for all of their cooking. Thus, in a number of villages of the Centre-nord and the Sahel, fuel requirements are wholly covered by millet stalks for many months, especially in the dry season.

**Other plant and animal wastes.** Besides millet stalks, cotton and sesame stalks are burned at Dédougou, cow dung in the Sahel, of course, but also at Toece and in the Ouagadougou pilot area in the Centre department. At Dantiandi (Sahel), some women said they use cow dung seven out of twelve months.

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.

**Coal and gas.** These fuels are rarely burned in rural areas, except in the Sahel where coal is used to make tea. Often, it is simply a question of embers recuperated after cooking. Gas is seldom used even in the cities.

**Women's preferences.** Women have definite preferences for one or the other kind of fuel for specific reasons. On the whole they prefer wood because it makes for 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 find wood easily and 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, 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 25. One housewife said that gas makes for quick cooking and is not tiring but she preferred wood (probably because of its price).

## Sahel women and the energy crisis

A region's energy consumption and its development are closely related. From the consumption percentages in the table, we can deduce the degree of development of the countries concerned since the share of energy sources other than wood clearly showed their respective degree of electrification and industrialization. Thus, Senegal, Mauritania and Niger have a consumption of energy resources other than wood much larger than Mali and Upper Volta, which are less industrialized. This was confirmed by a study of the United Nations Special Office of the Sahel which found that Mauritania's energy consumption rose from the equivalent of 44 million tons of coal in 1967 to the equivalent of 113 million tons in 1968, or an annual increase of 203 percent coinciding with the period of the start of certain mining activities which as a rule consume large quantities of energy.

Focusing our attention exclusively on household fuel we find that wood, charcoal and agricultural wastes represent just about 100 percent of the energy consumed by Sahel households. Actually we do not have sufficient detailed data on the use of energy by the Sahel populations, since they use mainly non-commercial energy sources.

It is certain, however, that commercial energy sources, and fossil fuels in particular already constitute a heavy burden on the budgets of Sahel countries. Since 1973 their price has increased constantly, sometimes requiring as much as 20 percent of national incomes to supply a modern sector almost exclusively limited to transport and production of electricity. Moreover, it is in these sectors that the world petroleum crisis has directly affected the women of the Sahel.

## **Increasing costs**

The cost of transport has increased both in the cities and in the countryside, causing serious hardships to many women who have had to either travel less or go to the city on foot, and cutting down the profit margin of those who trade at periodic markets.

If domestic electricity consumption is quite low in the Sahel countries as a whole, it is certainly because of its high price, being often produced by hydroelectric plants in an essentially arid part of Africa. Some countries - Mali and Niger - have hydroelectric potentialities but they are still undeveloped. Although the networks are inadequate and badly integrated, the wealthy and middle-income urban populations are getting gradually accustomed to the use of electricity for lighting, refrigeration and, to a lesser extent, air-conditioning. In recent years we have witnessed a marked increase in the use of electric household appliances (refrigerators and freezers) by women who earn some extra money through the sale of iced drinks and ice cream. In countries as hot and dry as those of the Sahel, this kind of trade finds a ready clientele in the schools and public services.

Naturally, women have suffered - together with the whole Sahel population - from general inflation and the deterioration of the terms of trade which have accompanied the world oil crisis since 1973. In addition, however, they have suffered and are suffering even more from what some economists call "the poor man's energy crisis."

## **[COLLECTING FUELWOOD IN MALI why many women have developed an environmental consciousness](#)**

### **Women and the poor man's 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 division of labour, 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 in a number of Sahel countries. There are however, some rare exceptions as in the regions of Dori in Upper Volta and Nguekok in Senegal 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!

For a long time there had been talk 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.

**The oil price rise forced people to see that there was a fuelwood crisis. The husbands of the women who gathered and bought it discovered that the land was bare of vegetation and the cost of wood and charcoal had soared.**

## Ouagadougou study

A study conducted at Ouagadougou by the Department of Forests and Water in April 1972 shows that even among wage-earners, the least privileged group, the monthly expenditure for firewood is very seldom below F CFA 1250, or 10-40 percent of salaries. This is because wood now comes from within a radius of 50-100 km from the city. When we think that the world oil crisis has contributed to price inflation of basic products (cereals, rice, edible oils, milk, lamp oil) in developed countries with basically strong economies and infrastructures, one can imagine the burden of increased fuel costs for urban families in Africa. But wood is not only a problem for the urban populations; it also concerns rural families. They must travel farther and farther afield to find it and devote more and more time to its collection - frequently 35 hours a day.

A study made in Mali in 1976 points out that a more widespread use of carts could save considerable time, since the distance covered for wood collection can extend to 5 km around a village. Yet such means, far from holding back deforestation, will only augment wood consumption and force the people to seek fuelwood from increasingly distant points until a major shortage will occur and reduce this consumption, unless some measures are taken to check the phenomenon. We can clearly see deforestation inexorably reducing the trees and shrubs separating two villages whose populations must seek their wood in an increasingly wide radius, at the risk of meeting and confronting each other one day when an irreversible desertification process will have become established.

All the Sahel countries are trying to ward off this spectre by different and varied actions.

## Some possible solutions

For the time being oil, electricity and nuclear energy cannot serve as substitute solutions for the domestic needs of the Sahel families. Therefore, the governments of the Sahel countries are turning to the resources available in the region to try and meet the needs of their populations without upsetting too much their balance of payments.

**Butane in Senegal and the Gambia.** Thanks to its favourable position on the Atlantic coast of

Africa, Senegal is able to import crude fossil fuels which can be refined locally. The butane campaign, which started in 1973, involves a major effort by the Government to ensure a butane-gas subsidy.

## Sahelian success

A mission of the Comité permanent inter-Etats de lutte contre la sécheresse dans le Sahel (CILSS), visiting the M'Bour region in November 1979, noted the success of the campaign. Some of the women told the CILSS that they used gas to cook the midday meal or breakfast, or to warm up food. For cooking couscous or the evening meal, they generally used the traditional three-stones fire. They mentioned the high cost of gas stoves which at the beginning of the campaign in 1973 cost F CFA 3000 and reached F CFA 5000 in 1977 despite the government subsidy. The Direction de l'enseignement ménager et social (Department of Domestic and Social Education) was directly involved in the campaign and was responsible for a study on the adaptability of gas and of Blip Bannekh gas stoves to the women's cooking methods and food habits. The results of this study led to the development of the Nopalch gas stoves which are more sturdy and stable and give a more even flame, hence a higher heating power. The only shortcoming mentioned seems to be the excessive flexibility of the control system which children can reach easily and which must be corrected to decrease the risk of accidents.

The relative success of the butane campaign in Cape Verde could be easily repeated in the Gambia where the Government recently adopted severe measures abolishing the use of charcoal and replacing it by butane gas in July 1980. However, it is essential to familiarize the women and other members of the household with the use of gas and its related equipment before its introduction on such a wide scale, for the safety of the users depends on such education. Butane gas is used by very few urban housewives in Mauritania, Mali, Upper Volta, Niger and elsewhere, who often use it combined with charcoal or wood, or all three at once. In the Sahel, in land-locked countries such as Mali, Upper Volta, Niger and Chad, this gas is not a fuel that can be utilized immediately on a large scale. This is due partly to its constantly rising price since the oil crisis of 1972/73 and partly to the fact that wood fuel is preferred by cooks for the preparation of certain dishes.

**Fossil coal.** The discovery of coal at Anou-Araren in Niger (15 million tons of reserves) raised great hopes for the production of electricity to supply the country's uranium mines and for domestic use as a wood-fuel substitute.

At the beginning of 1979, the Commissariat for Atomic Energy in collaboration with the Office national de l'énergie solaire (Onersol) and the Association des femmes du Niger undertook the testing of this coal for household use in both rural and urban areas. Coal and specially designed stoves of soldered sheet-metal were distributed to selected families, but the experiment failed. On the basis of reports from Dosso and Niamey, the coal had a very high ash content, approximately 50 percent. It was not surprising, then, that this coal, when used in a household stove, should be difficult to light even when kerosene was used to start it. It was also difficult to keep burning and gave off too much smoke. The users did not like it. Cooking time was very long. The stove design was defective. The adjustment valve became locked when the oven was hot, the grill was difficult to install and the coal had to be fed by the handful. All these drawbacks discouraged the women involved in the experiment and the tests were stopped before all the coal samples were used. Improving the stove would be too expensive, while relining the coal would be equally expensive and would raise the price of this fuel.

**Wood, charcoal and agricultural wastes provide almost 100 percent of the household energy in the Sahel.**

**Solar energy.** Sunshine, the renewable energy par excellence, is more than abundant in the Sahel countries. Many people and even the women of the region place great hopes in its domestic use. Research undertaken in the past 20 years, especially in Niger,

Upper Volta and Mali, has led to the development of a solar cooker offering undeniable advantages:

- The energy it uses is totally free and it does not pollute the environment.
- There is neither smoke nor heat radiation, the heat being entirely concentrated on the appliance.
- The appliance and its accessories are easy to care for.

However, against these advantages we must list the following limitations:

- The high cost of the solar cooker, from F CFA 17000-25000.
- The space it requires, due to the diameter of the reflector (1.5 m) and the support framework. Many housewives do not have a separate kitchen and cannot store these large appliances in their already small living quarters.
- The powerful reflections of the sun's rays which can damage their eyes.
- The lack of stability for certain kinds of cooking pots.
- The required use of metal pots for cooking instead of the traditional terracotta "canards."
- The very slow cooking process.
- The limited period during which the solar cooker can be used on cloudy or rainy days.

Solar energy researchers and technicians must proceed very cautiously because any haste and error can harm future decisions but they are, nevertheless, pursuing their efforts with the Human Sciences Research Institutes and the national women's organizations of the various countries. They have already had some unquestionable successes with solar water-heaters which are now often planned for or installed in public buildings such as hospitals and schools.

**Improving charcoal-making.** Charcoal is obviously preferred by many urban housewives in Mauritania, the Gambia and Senegal. In Senegal, fuelwood production rose from 46118 steres in 1967 to 107434 steres in 1977 while coal production increased from 306944 quintals in 1967 to 935192 quintals in 1977, of which 831275 were marketed in the city of Dakar alone. It takes practically 5 kg of wood to make 1 kg of charcoal with the traditional method. This is why there are major efforts everywhere to improve the methods and train the charcoal makers. For example, two USAID and UNDP/FAO projects in Senegal are seeking to improve charcoal-making and simultaneously promote a better use of this fuel through improved stoves such as the cast-iron sealed oven, under testing in the Gambia, or the "Malagasy oven" which is being encouraged in Senegal.

**Reforestation.** Research on substitute energy sources such as wood shavings, groundnut shells, maize ears, or "Ntabakoumba" (Bambara name) nuts is going on, together with mining and solar energy. However, at present, the use of wood as a domestic fuel by the overwhelming majority of rural families as well as by some urban families is both a necessity and, unquestionably, the preferred fuel.

To meet the growing needs for fuelwood, directly linked to population growth, tree planting at all levels individual, communal and industrial should be encouraged. In each of the countries of the region there are vast reforestation projects in which women are already participating either individually or in groups. A women's association at Kaya participated enthusiastically in a reforestation campaign in Upper Volta. However, a year later there was bitter disappointment: the participants' efforts had not met with much success because the seedlings had not been sufficiently watered and, above all, because the young trees had not been protected against browsing animals.

But what is new and important today in the Sahel is the cooperation which seems to be developing between the technical services in charge of reforestation and environment protection and the women, who are the main users of fuelwood. Apart from the labour force they constitute for reforestation operations, women as organized groups can cooperate closely with the technical services in the selection of the best indigenous as well as exotic wood species to be used for cooking meals or for other uses, for example, for fish smoking.

The role of women in the maintenance of the trees planted in or around the villages is essential, for it is they, together with the children, who traditionally ensure regular irrigation with water that has already been used. Specific advice on the precautions to be taken in this field would prevent many problems. Better information about basic forestry practices, brush fires and the areas open to forest exploitation would certainly help women to contribute more effectively to the conservation and development of this national heritage. Since women are the main users of wood consumed as domestic fuel, they are highly sensitive to any effort aimed at increasing the availability of wood, thereby reducing the financial and physical cost to them. In normal times, the wood collected by women and children is generally confined to dead wood. Since they have neither the strength nor the tools needed to cut down trees, they do not destroy the forest resource.

In any case reforestation is a long-range operation, requiring patience. Women can provide effective support to reforestation operations by using less wood for their cooking, through their talent as organized and thrifty housewives and through the adoption of new cooking stoves.

### **82 percent of the total national energy needs of eight Sahel countries come from wood**

	<b>Percent</b>
Cape Verde.....	70
Upper Volta.....	94
Mauritania.....	69
Senegal.....	60
Gambia.....	87
Mali.....	93
Niger.....	88
Chad.....	89
Average.....	82

**Source:** Club du Sahel, Paris

**Decrease of wood consumption.** The quantity of wood used to prepare a particular dish depends on a number of factors such as the nature of the food to be cooked, the quantity to be prepared, the utensils used, the type of cooking selected and the source of energy use.

With the traditional three-stones method, it is calculated that only 5-8 percent of the heat

released by wood combustion is used for cooking. The rest is lost in the atmosphere. There exist today a number of types of cooking stoves which provide better transfer of the wood-fuel heat to the pot and can, therefore, reduce the normal wood consumption by 40-50 percent. However, apart from technical improvements of wood-burning stoves, it must be recognized that the human factor - in other words the housewife's talents play an absolutely determining role in conserving fuel. Good work organization tends to reduce the housewife's moving about, and a watchful attitude makes for good surveillance of the fire and prevents the wood from burning uselessly outside the stove. A methodical and attentive cook knows when to put out the fire so that logs and coals can be used later. She also knows how to programme the cooking of her dishes, and especially the sauces, which she will not make unnecessarily thin and then try to thicken by long simmering. Variations may depend on whether she has on hand a large amount of wood or only a few pieces painfully purchased every day. It is simply a universal phenomenon related to the abundance or scarcity of a commodity. Even in the absence of any shortage, there are traditional wood-saving practices such as the protection of fire against wind by positioning the stove well or screening it from the wind, and slightly wetting fuelwood that is too dry and burns too quickly.

Why the Sahel women's efforts to reduce the quantity of fuelwood for cooking should have remained so fragmentary and rudimentary, and why the most widespread kitchen equipment should still consist basically of three stones is still unknown. But we must point out that, throughout the Sahel, from Casamance to Zinder, we find terracotta or brick stoves, some quite similar to enclosed stoves. This is an attempt to use combustion heat to the maximum by making it pass under several pots at the same time.

In the Sahel, as in most essentially rural societies, women are the ones who have most to do with fuelwood. The conditions are ripe in all the countries of the Sahel for cooperation between research workers, planners and foresters concerned with the fuelwood crisis and women who have practical experience in the everyday use of household fuels. Such cooperation could result in improved working and living conditions for the many women and children who have the increasingly difficult task of fuelwood gathering. It could also result in preserving a fragile environment from further destruction by the pressing needs of family cooking fires.

