
Improved Woodstoves: Users' Needs And Expectations In Upper Volta

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CONTENTS

FOREWORD

INTRODUCTION

FRAMEWORK OF THE STUDY

METHODOLOGY

I. EATING HABITS AND COOKING PRACTICES

II. STOVES USED

III. FUEL USED

IV. THE INTRODUCTION OF IMPROVED STOVES AND WOMEN'S ASPIRATIONS

V. CONCLUSIONS

VI. RECOMMENDATIONS

ANNEX

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FOREWORD

Energy is one of the essential factors of development. Energy enables man to stay alive, and gives him the power to control nature in order to get from it the necessary elements of a better life.

Since the 1973 oil crisis, the word "oil" has tended to become synonymous with energy. Oil has overshadowed all the energy sources which preceded it in human history . These other sources continue to be the only ones used by the majority of people in developing countries.

In Upper Volta, hydrocarbons account for only 5 percent of the country's energy needs, and are fueling vehicles, industrial equipment, and, to a lesser extent, agricultural machines.

According to Soumana Traore(1), national consumption of hydrocarbons, which approaches 100,000 tons, represents an outlay of 3 million CFA(2) per year, or 20 percent of the national export revenue. Since the need for hydrocarbons increases at 12 percent a year, and considering the rise of oil prices on the world market, it is likely that before the end of the century meeting national needs will require a purchase cost which considerably exceeds the national budget.

Consequently, oil, gas and electricity cannot be considered as sources of domestic energy.

Domestic and handicraft needs of families are met by wood (heating, iron-works, food processing, and meal preparation), and by the sun (drying and preservation of food products.)

As far as wood is concerned, the situation seems fairly serious. A. J. Deville, F.A.O. expert, says: "If we estimate the needs of each inhabitant at about 1.35 stère a year (0.7 [m.sup.3]), the use of firewood rose in 1974 to 3.9 million cubic meters which means yearly overfelling of nearly half a million cubic meters beyond the usual total forest output."

(1) Director of the Societe Africaine d'Etudes et de Developpement (SAED), Ouagadougou.

(2) Approximately 250 CFA=\$1 U.S.

This overexploitation of forest resources is of concern mostly in the central plateau, where nearly 60 percent of the entire Voltaic population lives, and "whose annual needs for wood at the beginning of the next century will be tremendous--estimated at more than 4 million cubic meters of firewood within about 20 years, more than the total annual production of all the current forest resources of the country."(3)

It is obvious that these demands on wood resources represent a serious threat to the ecological balance, which has already been deeply affected by brush fires, collection of wood for other needs (construction, handicrafts, etc.) and by clearing of forests for agriculture and for cattle grazing.

Given that situation it is no wonder that the price of wood underwent an increase of more than 50 percent between 1975 and 1978. In Ouagadougou, this represents about 30 percent of the buying power of the poorer classes.

To remedy this situation, it is necessary to triple the annual replanting of forests on a large scale (1,500 hectares a year at present) around the cities of the Mossi plateau, while making sure that the pace of reforestation in the rural centers is increased tenfold. Within 20 years, we want to reach a wood fuel production level sufficient for the population's needs, in order to permit natural forest vegetation to regain the strength necessary to regenerate the soil in agricultural fallow lands.

The Sahelian people are very aware of the consequences of the situation: little rainfall, drought, and desertification. Consequently, they are willing to participate in whatever reforestation programs are being undertaken.

To reforest is indeed the first priority of our country. But planting and growth of a tree require water and continuous care for several years (six to seven years minimum for the rapid growing species). At present, "extension of artificial forests--by 40,000 hectares a year is, especially on the central plateau, completely out of proportion to the available land, personnel, and budgetary means."(4)

(3) A.J. Deville, *Le developpement des ressources forestieres en Haute-Volta*.

(4) *Ibid.*

In spite of efforts in education and information, every year brush fires destroy vegetation over enormous expanses.

Considering the increase in population and current agricultural practices, each year thousands of hectares of arable land are cleared--felling and destroying trees. There is no doubt that unrestricted needs will follow the population curve upward and limit the area available for reforestation.

This is why the role of women as consumers of wood appears more and more in national energy and environmental protection programs. Indisputably, this is a new aspect of women's participation in development, and technical and political leaders will increasingly be aware of this.

The integration of women in the development process which is strongly advocated by the Federation of Women(5) and which has become a political credo these days, will become a reality only if the vital and daily activities of women are taken into account. Among those activities is the preparation of meals which allow adults and

children to regain the strength to work and to survive. This is an important activity, and one which has direct bearing on the serious problems of energy and environment.

Since 1977, action has been taken in Upper Volta to reduce wood consumption and to ease the toil of housewives through the introduction of improved stoves.

Briefly, this is what has happened:

* In March 1980, the German Forestry Mission, a pioneer in this field, built about 800 brick and cement stoves. The German program planned construction of some 600 stoves in the Black Volta region (Dedougou), the Sahel (Dori), and the Western Center (Koudougou). The program, which has already been implemented in the Center region (Ouagadougou), will eventually include two other regions, one of them the Yatenga. For brick stoves built in rural areas, the only cost of any concern was of the manual labor. (The cost, unfortunately, was not given.) The brick stoves last about two years. Cement stoves, for family or collective use, cost between 3,000 and 9,000 CFA, depending on the number of holes and the size of the stove. These stoves, constructed in urban or semi-urban centers, last longer.

(5) Upper Volta's Federation of Women comprises l'Amitie Africaine, l'Association des Femmes Voltaïques, l'Entraide Feminine Voltaïque, and l'Association des Veuves et Orphelins de la Haute-Volta.

* In the Northern Center region (Kaya) the U.S. Peace Corps set up a small company for constructing improved stoves. It employed young Voltaic men and sold about 50 stoves between January and March 1980, each costing 3,000 (CFA).

If the success of this first attempt is confirmed, more small companies such as "Modern Stoves of Kaya" will be created. Experiments will also be conducted to perfect special stoves for the preparation of dolo (a local beer made out of sorghum).

A village project is envisioned as well as the construction of 200 stoves between May and September 1980. This project will provide materials and guarantee the training of masons, while villagers will do all the work.

* In addition to these two projects, which include research to "fine tune" stoves adapted to local working conditions, the Fonds Europeen de Developpement (FED) and the Association Internationale de Developpement Rurale (AIDR) initiated a project with three components in January 1980: a comparative study of the designs of improved stoves in use in the country; the construction of prototypes selected in collaboration with the Ministry of Social Affairs and women's organizations; and the publication of news articles, and radio and T.V. debates.

These three improved stove construction and dissemination projects are augmented by two research projects. One concerns technical and scientific research to formulate mathematical rules for the construction of fuel efficient stoves. It is being conducted by the University of Eindhoven and the TNO Research Institute, with financing from the Dutch Government. The studies envisioned will be carried out in Dutch laboratories and in the Sahelian countries, in close collaboration with national institutions for scientific research. The other research

project involves both a technical study of energy and materials available in Sahelian countries, and a sociological study of food habits and cooking practices of the Sahelian people.

The following report presents the results of a sociological study undertaken by VITA,(6) and funded by IBM, with the participation of people from the Ministries of Social Affairs and Women; Rural Development; Environment and Tourism; the Women's Technical Training section of the AVV (Volta Valley Management); and, the Federation of Voltaic Women.

We would like to pay tribute to the people responsible in those ministries and organizations especially to the Minister of Social Affairs and Women, whose moral and material support was a decisive element in carrying out the study. The continued interest and effective participation of the staff and field workers who often worked overtime, demonstrated their deep interest in a technology which helps families and women meet a basic need. To all of them, we express our gratitude for this first collective work which, we hope, will lead to the concrete results the population awaits.

(6) VITA (Volunteers In Technical Assistance) is a U.S. non-profit voluntary organization.

GENERAL INTRODUCTION

The quantity of wood used in preparing a meal depends on several factors, such as:

* type of food and dishes prepared; * size of family; * number of meals prepared each day; * kind of stove on which cooking is done, and its position in regard to the direction of the wind; * quality of the fuel; * utensils used; and, * organization and "know-how" of the housewife, etc.

These essential factors are often masked by the widespread belief that Sahelian housewives use more wood than is necessary.

In a country in which 94 percent of the energy needs are met uniquely by wood, present consumption (1 kg/inhabitant/day) seems to be excessive and constitutes a real threat to the already precarious natural environment.

If it is true that we have only a few more years (20 at most) to avoid the inexorable and irreversible desertification of the major part of Upper Volta, we must act quickly. It is only by acting to bring back what we had that we will be able to move forward, carefully and methodically, to safeguard the future.

The seriousness of the situation and the urgency of finding realistic and humane solutions demand our lucidity and vigilance. We have to be aware of what people do, what they want to do, and what they are capable of doing. As Tristan Bernard says: "To be happy with human beings, one can only ask them for that which they can give."

In order to know what the people, and, more specifically, the women of the Sahel, can contribute to the success of a program for the dissemination of improved stoves, the VITA sociological study intended to identify the following:

I. The people that cook, and during what periods of the day they cook.

- II. The foods consumed and methods of preparation.
- III. The equipment and cooking utensils used.
- IV. The fuel used and preferences in this area.
- V. The incidence of smoke, its effect on health, and its domestic utility.
- VI. The rites and customs related to stoves and to cooking.
- VII. Women and families' attitude and financial ability to finance improved stoves.
- VIII. The field agents to be trained and mechanisms to be set up for large scale production of improved stoves.
- IX. The Voltaic institutions and local social structures likely to be involved in experimentation and dissemination of improved stove prototypes.

The information gathered should guide three groups of people, the triad upon which any action on improved stoves should be based, as follows:

- * Researchers, to improve the efficiency of stoves;
- * Artisans, to build the stoves according to the fuel and heat transfer rules provided by the researchers, taking into account the needs of women; and
- * The women themselves, to employ and adapt to reality the researchers' theories and the artisans' models.

PRESENTATION OF THE FRAMEWORK OF THE STUDY

The VITA study was planned to take seven weeks, in two parts: four weeks during the dry season (May to April 1980) and three weeks after the harvest (November to December 1980), so as to cover all the regional and seasonal variations in the chosen area.

Research was conducted in a geographical base which includes four of the ten regions in Upper Volta. These regions, the Center, the Northern Center, the Sahel, and the Black Volta seemed to us to be fairly representative of the areas most seriously threatened by deforestation and deterioration of the natural environment, due to social, economical and climatic diversity.

Furthermore, there is already some activity underway in the Black Volta, the Center, and the Northern Center, even though by every indication the Sahel is the region most likely to benefit from the experience acquired so far.

The Black Volta

As early as 1977, the first improved stoves had been constructed in this region by a German volunteer, first in Nouna and then in Dedougou, the regional capital.

The Black Volta today has several hundred stoves, constructed in Bomborokuy, Goui, Koro, Djonkuy, and Ouarkoye.

Sharing a common border with Mali, the Black Volta's population is essentially composed of Bobo, Bwa, Dafing, Fulani, Samo, Marka, and Mossi immigrants who work in subsistence agriculture (corn, sorghum, millet, fonio, yams, potatoes, peas, beans), and in cash crop agriculture (cotton, peanuts, tobacco,...).

Reasonably good rainfall and relatively fertile soil favor good yields and an income per inhabitant which is slightly above the average. This income, if wisely invested, would permit real economic progress in the region.

The existence of temporary streams and of one river (the Black Volta) explains the presence of forest corridors and the relatively thick ground cover.

The Center

As its name indicates, this region is in the middle of the country. Its population is composed mainly of the Mossi people, and it has the highest population density in the country. Governmental administration as well as financial and banking establishments have their headquarters in the national capital, Ouagadougou, which explains the high rate of demographic growth, due both to natural growth and to the rural exodus of younger people in search of jobs.

Several agricultural and social development organizations have their offices here; the untiring work of courageous people, tied to the ancient and tired land, producing millet and ground nuts.

The workshop which constructs and exports the improved stoves of the German Forestry Mission opened its doors in Ouagadougou in June 1979. This allowed access to the urban dwellers likely to buy the stoves, helped make people aware of the need for improved stoves, and helped meet the demand created.

The Northern Center

Situated between the Center region and the Sahel, the Northern Center region has a granite substratum peculiar to the central plateau.

The predominant ethnic group is Mossi, and the main crops are millet, potatoes, beans, and cotton. Market gardening is well developed in the region of Kongoussi, north of Kaya.

The main river of the region is the White Volta. Although it is dry six out of 12 months, it is lined by a forest corridor which amply supplies the capital.

Since 1979, a Peace Corps Volunteer has constructed several dozen stoves, mostly in the town of Kaya, where the wood problem is becoming serious.

Between May and September 1980, a small rural project will attempt to construct 200 stoves around Kaya, in cooperation with the local populace.

The Sahel

This is the region which exhibits the typical Sahelian characteristics: sandy soil and sand hills which are moved by gusts of wind, light rainfall, and a predominance of thorny plants.

The most common tree is the acacia, though artificial planting efforts use neem, cassia, and melinas in villages and semi-urban centers.

In addition to the domestic use of wood, before the drought a sizeable number of cattle seriously threatened the vegetation in certain areas.

Agricultural crops which are abundant are sorghum and a variety of millet that grows and ripens within three months.

Handicraft skills are quite developed, especially in weaving and basket making.

The population of the Sahel is composed mostly of Fulanis, but also has Rimaibes and Djermas, who seem to have the same way of life as their brothers in Niger, whose border lies some 50 kilometers from Dori.

While the Center and the Northern Center regions will be the sources of improved stoves for the other regions of Upper Volta, we may suppose that operations undertaken in the Black Volta and the Sahel regions could spread very quickly outside the borders to Mali and Niger, which are of equal concern in the CILSS regional project for the dissemination of improved wood stoves. (The CILSS is the eight-member country Permanent Interstate Committee for Drought Control in the Sahel).

METHODOLOGY

The Lepeleire/Ki-Zerbo mission concerning "the improvement of stoves for the domestic use of firewood" had recommended, among other things, that "the introduction of improved stoves be integrated into rural development projects, particularly those in environmental improvement, food self-sufficiency, nutritional education, reducing domestic work, and improving women's monetary incomes, especially in rural areas" (May 1979).

This recommendation, approved by the national experts of the CILSS "Ecologie-forets" team in Niamey in June, 1979, guided us in the choice of the organizations and offices whose collaboration has been indispensable in carrying out this study.

The study concentrates on the food habits, cooking practices, and the role people (particularly the women) could play in a program of stove improvement. We have consulted offices and organizations which include both urban and rural women.

The study was undertaken in the four regions as follows:

* In the Black Volta, by the women trainers of the "Education and Participation of Women in Development" project, whose activities are integrated appropriately into the ORD (regional extension service) program.

* In the Center, by social workers responsible for maternal and infant protection activities in the social centers; women trainers in the "Education and Participation of Women in Development" project; women trainers in "Volta Valleys Management" (AVV); the women trainers in the Voltaic Women's Federation; and students of the Women's Handicrafts Training Center of Gounghin and of the Women's Technical Training School.

* In the Northern Center, by women trainers in the "Education and Participation of Women in Development" project of the Kongoussi area, in collaboration with the social workers and the ORD women trainers. * In the Sahel, by ORD women

trainers, in collaboration with the women social workers of the "Education and Training of Sahel's Women" project, and those of the Foundation for Community Development.

Since these people knew the environment and since they had been working with women on a daily basis, these women social workers and trainers(7) were in the best position to head an inquiry team concerned with such intimate aspects of family life as food, cooking, and, to a certain extent, income in Sahelian countries. Without a doubt, it was the interest and openness of the interviewers, who chose which villages and individuals to interview, that inspired the confidence necessary for the people to respond to the questions, and even to express their satisfaction at having been chosen to participate. This was true in all but a few isolated cases.

Three questionnaires were distributed: Questionnaire A applied to groups of women regularly involved in different activities such as child care; sewing and knitting; teaching, reading, and writing; and agricultural education. These group interviews were intended to collect the maximum number of opinions concerning various problems, while trying to get a village level consensus, if not of the entire region. A large number of people (2,600 altogether) were interviewed and made aware of the problems of improved stoves between April 1 and July 16, 1980.

Questionnaire B consisted of an interview and seven day observation of a housewife's activities.

We wanted to be in a better position to support the information collected during the group sessions by individual interviews.

Sixty-one housewives were observed and interviewed about their cooking techniques, their wishes and expectations, and their feelings about purchasing improved stoves.

To look beyond the circle of the housewife, we compiled Questionnaire C for the guardians of traditions, knowledge, and possibly the decision makers in the area that concerns us. These are the older women and men, and the technicians who work in the regions (extension agents in the fields of water, forestry, agriculture, health, education, general administration, etc.). The questions posed sought to find out what changes had occurred in food habits and fuelwood supply; customs, causes, and possible consequences of these changes; and recommended action.

(7) In Ouagadougou and in Kaya, three men who are social workers also led inquiries.

This was sort of a thermometer to measure to what extent these people were aware of the current situation with regard to deforestation, soil erosion, and suggested solutions. One hundred twenty people (men and women) agreed to answer this questionnaire.

The quality of the information gathered was sometimes limited by the short period of time during which the study had to take place (before the rainy season and the farming period), and by the distances which had to be covered in the four regions.

The desire to collect more and more information sometimes resulted in questionnaires that were too long and difficult for certain interviewers.

Although the interviewers' preparation involved a general introduction to the problems of energy and environment in Upper Volta, as well as detailed reading of the questionnaires and the complete translation of these questionnaires into national languages (More for the Center and the Northern Center, Dioula for Black Volta, and Fulani for the Sahel), some of the interviewers had difficulty in translating the questions as well as the answers they received. A control visit we made to Tanghin-Dassouri allowed us to look at the information the investigators received which they could not categorize in their reports.

We will take these problems into account for the follow-up study, which will enable us to fill in some of the missing data.

In any case, here follow the initial results of a collective task carried out in good faith and with enthusiasm by Voltaic directors and field workers.

I. EATING HABITS AND COOKING PRACTICES

Food Consumed, Quantities, and Dishes Prepared

The diet in Upper Volta is based on foods from three food groups:

* cereals (sorghum, millet, corn, and rice); * dry vegetables (beans, peas); and * tubers (yams, sweet potatoes, cassava, fabirama, etc.

It is necessary to add cooked greens, either eaten alone or mixed with cereals, to these various foods. Certain variations are found in the diet according to regional availability. For example, one finds greater consumption of fonio, yams and sweet potatoes in the Black Volta, more frequent consumption of fresh vegetables (potatoes, green beans, and peas) in Kongoussi, and macaroni and moroccan couscous in the Ouagadougou area.

Cereals are eaten either in the form of porridge, or in a dough (to or sabgo), a type of thick pancake which is prepared in three steps:

- a) The water is heated in a metal or clay pot.
- b) When the water boils, flour which has been mixed with cold water is poured in. This is the way porridge and starch are made.
- c) After it has cooked awhile, flour is added to the porridge, beating it constantly with a wooden spatula to avoid lumps forming.

When the dough is thick enough, it is served in a large cake or in small balls on enamelled plates.

Fonio and flour can also be steamed for many hours, as is done for cooking couscous.

Rice is cooked with meat and vegetables (Djoloff rice), or plain and served with a sauce or stew.

Dry vegetables and greens take a long time to cook, and are served mixed with oil.

These basic foods are served with vegetables (tomatoes, cabbage, sorrell, spinach, okra, peppers), and several local condiments made out of seeds or French "Maggi Cubes."

In rural areas, little fat (karite butter), meat (beef, sheep, goat, pig) , or fish (dried or smoked) is consumed. Sauce or stew is broth made out of nere seeds or sorrel, fresh or dried greens, salt or potash.

In urban areas, sauces or stews are made out of braised meat, with onions and tomatoes. A great deal of water, boiled for a long time, is mixed into this preparation, and it is then simmered. Fresh vegetables such as okra, baobab leaves, peanut or sesame paste, are added to thicken the stew.

The quantity of food prepared depends essentially on the size and income of the family, food availability, and on the housewife.

As indicated in the following table, the families observed were generally large families. They often exceeded the average number of people per family (five, or seven, according to geographic divisions).

Although we do not have enough reliable data, the information we did collect reveals that food rations can vary from one to four times: two bowls of millet for six people in a village in the Northern Center; two bowls of millet for six people in the Sahel; half a bowl of millet for six people in the Black Volta; one bowl of rice for 16 people in a village in the Center; one bowl of rice for 10 people in the Sahel; and, three bowls of rice for 10 people in Black Volta.

Besides the tastes of the inhabitants, the variations in quantities can be explained by the standard of living of the family, the presence of children for whom one keeps the leftovers, and the number of meals eaten every day. When only one meal is cooked a day, the quantity of prepared food is more important than when cooking is done several times a day.

In any case, in all the regions the quantities prepared for dinner are greater than those for lunch. The reason is probably that in rural areas the most important meal is often dinner, and leftovers, warmed up again, are given to the children as breakfast.

SIZE OF FAMILIES AND QUANTITIES OF FOOD PREPARED

Region Size of Number of Quantities prepared family families observed

1 to 6 pers. - 7 to 10 pers. 11 2 1/2(9) bowls/8 pers. 1 1/2 bowls/10 pers. 10 to 15 pers. 10 1 1/2 bowls/ 11 pers.

CENTER 1 1/2 bowls/15 pers. 16 to 20 pers. 5 1 bowl of rice/16 pers 5.9(8) 4kg. rice/17 pers. 1 1/2 bowls millet/16 p.

More than 22 Persons

1 to 6 pers. 3 2 bowls/6 pers. 3 bowls/6 pers. 7 to 10 pers. 5 10 to 15 pers. 3 3 bowls/11 pers. (lunch) NORTHERN CENTER 4 bowls/11 pers. (dinner) 5.9 15 to 20 pers. 1 3 bowls (flour)/20 per More than 20

4 Persons

1 to 6 pers. 2 bowls/6 pers. 1 bowls/6 pers. 2 bowls/5 pers. 7 to 10 pers. 1 bowl/7 pers. SAHEL 10 to 15 pers. 2 bowls/10 pers. 15 to 20 pers. - 4.4

More than 20 Persons

1 to 6 pers. 3 1/2 bowl of millet/6 p. 7 to 10 pers. 4 3 bowls (rice)/10 pers 10 to 15 pers. 4 2 bowls (flour)/12 per 3 kg (rice)/12 pers. BLACK VOLTA 1/2 bowl(peas)/12 pers 2 kg.(flour) 5.3 15

To 20 pers. 1

More than 20 2 1 tub/day/36 pers. persons

(8) The figure indicated is the regional average

(9) One bowl weighs approximately 2.5 kg.

Number of Preparations of Meals

Breakfast is mainly made up of the leftovers of the day before, warmed up again or served as porridge. In some areas, to is made with the flour left over from the day before. On certain occasions, the meal is prepared and eaten later (9, 10, or even 11 a.m.) than usual 5:30-7 a.m.). This is especially the case in the region of Kongoussi, in the families observed in Baad-Noogo, Sanwi, Baam and Tampilga. In that case, the late breakfast becomes a brunch and no meal is cooked until the evening.

Lunch, unless combined with breakfast, is not very common in the Center or the Northern Center regions, except in urban and semi-urban areas. Lunch is generally prepared between 9 a.m. and 12 noon, except in the Sahel where a number of housewives cook between 12 noon and 2 p.m. It is the meal where one most often eats rice.

Dinner is the meal prepared in all the regions. To is the most common dish, but one also finds couscous. In the rural areas, dinner is usually prepared between 6 and 9 p.m., but some cooks start preparing it right after lunch to take advantage of the fire. This is the case in Dedougou and Ouagadougou, where the housewives observed in Dapoya and Kalgodin prepare dinner between 3 or 4 p.m. and 6 p.m. Some housewives prepare dinner very late, between 8 and 9 p.m. (Badnongo), or 8 and 10 p.m. (Bouloye), and even between 10 and 11 p.m. (Brouyo).

Utensils Used

The various dishes are prepared in either clay or aluminum pots.

The latter are becoming more prevalent, but clay pots are still preferred in the rural areas for the preparation of dried vegetables, the sauce or stew for the to, and different infusions.

Many women want to switch from clay to metal pots. In the city, every woman possesses at least two pots, one for the to or the rice, and another for the sauce or stew. Like the portions of food, the sizes of pots do not always correspond to the

size of the family. For instance, a housewife feeding 6 persons will use a #6 pot for the to and a #3 pot for the stew, whereas an AVV housewife will use a #6 pot to cook the to for 11 persons and a #4 pot for the stew. Although we did not record the various numbers for the pots used by the housewives, it has been verified that the sizes we encountered most frequently were #2 1/2, #3 and #4 for the stew, and #5 to #7 for the main dish. The holes in improved stoves can be adapted to these different sizes, and movable rings, if needed, would suit the majority of the housewives.

Cooking Techniques and Rate of Combustion of the Fire

We have briefly described the most common cooking methods. As indicated in the following table, cooking generally requires a long time.

PREPARED DISHES SIZE OF COOKING PERIOD DURING FAMILY PERIOD WHICH POT IS COVERED Rice 12 pers. 1 1/2hr. 1 hour

Stew 12 pers. 2 hr. almost all the time

Beans 7 pers. 4 hours During the entire cooking process Broth 6 pers. 45 min. Until the water to 1 hr. boils

To 8 pers. 1 hour 30 min. at the beginning and 10 min. at the end

Couscous 7 pers. 2 1/2 hr During the entire cooking process

To-stew 7 pers. 30 min. 20 min.

It should be noted that on general holidays, in the city and also in rural areas, to is eaten with two sauces: the usual glutinous sauce, and a meat or fish broth.

During meal preparation, the fire is very high at the beginning and during 3/4 of the cooking time. It is then lowered for 10 to 20 minutes at the end.

This reduced heating period is better for cooking starchy foods and for simmering stew so that the oil rises to the top (a method used particularly in the cities).

Depending on the region, housewives often prefer to cook the dishes one after the other (to and stew or sauce; rice and stew) instead of cooking them at the same time.

This tendency is very common in the Sahel where, out of seven women observed, five cook the to and the stew one after the other. It is also common in Titinga (Kongoussi) where six out of seven women prepare the dishes successively.

Although some housewives practice both methods, most of the women seem to believe that successive cooking of dishes consumes less wood than cooking more than one dish at a time, which would require using two stoves.

Burned food

The intensity of the fire is linked directly to the presence of burned food, which sticks to the bottom of the pots. Food tends to cook less rapidly and to burn less in clay pots.

Although they are quite aware that watching and regulating the fire more carefully can reduce the quantity of burned food that remains in the bottom of the pots, many housewives acknowledge that they cannot avoid this annoyance, particularly

with to and Djoloff rice.

Burned pot bottoms are not easy to clean, sometimes affect the taste of the food, and in any case they are a waste of food--something that should be avoided.

In the Black Volta some housewives first rub the bottom of the pot with karite butter, which serves as a protective coating.

Leftovers and What They are Used For

In spite of the scarcity of food, Sahelian housewives always try to prepare a little more food than necessary for the family. This practice has its origin in the strong tradition of African hospitality, where at any time an unexpected stranger will have something to eat. Leftover food may also serve as a snack or breakfast for the children. Leftovers are also given to beggars and pupils of Koranic schools whose education involves learning humility through begging. Saving a portion for the "garibou" is part of the Moslem housewives' mentality, especially in the Sahel region.

When these leftovers are not completely consumed by strangers, children, beggars or domestic animals, they are kept, dried and used in other dishes for other meals.

Cooking for Purposes Other Than Meals

In addition to the preparation of food for meals, housewives use wood to heat water, to cook various products for the family's consumption or for business (nere seeds, sorrell, peanuts, fritters), and to prepare infusions which are very common among African drugs and especially used for children.

These preparations are generally made after meals are cooked, except for the water which may be heated before breakfast is prepared (especially in the city), or while the meal is being prepared (especially in the Black Volta).

In all four regions, people use warm water for bathing, at least once a day either in the morning or evening, especially during the rainy and cold season (from June to February).

Some families use, or wish they could use, warm water twice a day, in the morning and evening, according to regional availability. Besides the infusions made with medicinal herbs in Upper Volta--especially in the Sahel--there is the practice of giving babies warm water to drink at bathtime, and from time to time throughout the day, four or five times.

During childbirth, women must have fire and warm water available at any time. Stoves which conserve heat and make warm water available all the time would be most welcome.

Embers and live coals are not enough for these purposes. They require additional wood.

During the rainy season, in certain regions such as Tampilga (Kongoussi), housewives light the fire immediately after preparing the evening meal, and cook the beans or vegetables for the field workers' lunch.

Responsibility for Cooking, and Rules Related to the Preparation of Meals

Who cooks? In the cities and villages studied, women and girls were responsible for the cooking. In fact, cooking is carried out by the woman of the house, who is sometimes helped by her oldest girls or by relatives living under the same roof.

Among the housewives observed, the youngest was 14 years old and the oldest 110 years old. They were from Tanga and Bissiga, in the Center region.

From the age of 10, young girls are closely involved in the preparation of meals.

However, this initiation of young girls to housework was not observed in the seven families studied in the Sahel, where the age for marriage is noticeably lower than in the other regions. Three hypotheses are given below, and will be verified later.

- a) In the families observed, there was no girl old enough to work in the kitchen.
- b) The families tended to spare the young girls, due to the particularly difficult living conditions characteristic of this region.
- c) Apprenticeship in domestic responsibilities takes place after marriage. Indeed, several answers received indicated that the housewives only used their stoves six months or even a year after the wedding.

The children who help their mothers with housework belong, generally, to the female sex. In Zura (Kongoussi), one housewife indicated that she was helped by her 18 year old son. This could be explained by the absence of girls, as was the case, in fact, of the mother of Soundiata Keita, emperor of Mali.⁽¹⁰⁾

Rules Observed During the Preparation of Meals

African culture is rooted in animism and vitalism, a belief in the existence of a living and organized force inherent in things, beings, and their actions.

(10) cf. Soundiata Keita, or l'Epopée Madingue de Djibril Tamsir Niane.

Preparing food and eating are two essential means of maintaining this vital force. Because of this, these two activities were and are still strictly regulated in certain traditional circles. One cannot prepare and eat food under simply any circumstances or behavior.

One of the most widespread rules is silence, to be observed both by the housewife preparing the to and by the guests during the meal. In the Sahel, the Center and the Northern Center, housewives indicated that it was forbidden to sneak or to sing during the beating of to.

Certain people even require that those who are around the housewife be quiet as a sign of respect. Under no circumstances may one quarrel during the preparation of the to.

In the Black Volta, where this rule does not exist, one does not go far from the fire during the preparation of the meal. This is probably to Prevent the fire from going out, or from fear of food poisoning.

Above all, one must not drop the spatula used to stir the batter into the pot. This is why it is important to be comfortably seated and to use one's knee as support. This is probably why it is forbidden everywhere to stand up while beating the to, except when the quantity of food prepared requires standing (large families, holy days, etc.).

A Bissa housewife from Tenkodogo, who was interviewed in Ouagadougou, said that the housewife must not prepare the meals during menstruation.

In the Center region, in Bendogo, Tanghin-Barrage, and Komsilga, it seems that one must avoid standing up while pouring water into the pot and while preparing the stew. The housewife must sit down or, if absolutely necessary, bend over the pot.

In the Northern Center region, notably in Kongoussi, one must abstain from saying the name of certain kitchen utensils (especially spatula or calabash); and under no circumstances should these be allowed to burn. The pot has to sit securely on the stove and should not make noise during the beating of to. In order to keep the pot from hissing, one should not pour water into it right after cooking the to. (This hissing sound is produced by the temperature difference between the heated bottom of the pot and the water which is at a lower temperature. In any case, this is a good precaution to take to avoid cracking the pot.

For certain preparations, very precise things are forbidden or recommended: one must not knead fritter dough with both hands, whereas one must laugh while preparing the soumbara so that the nere seeds split easily.

These rules are mentioned for the reader's information; most have disappeared or will disappear because of the influence of urbanization and, above all, of religion. Housewives clearly stated that their religions (Catholic in the Black Volta; Moslem in the Center, Northern Center, and Sahel) had no specific rules pertaining to cooking.

II. STOVES USED

Type and materials

The study confirmed what we already know: Most of the women observed cook on three stones (yiguiré or yagare in More, gwa in Dioula), or on stoves which are in fact nothing but variations of three stones.

In the Center, the Northern Center and Sahel regions, one finds only the customary three stones. In Dori, however, there is a traditional stove (femmare), also found in Niger. An old Mossi farmer told us that since in some villages it was difficult to find large stones, women used to dig two cross-shaped furrows, into which the wood is laid. The pot is set on a hole at the intersection of the two furrows. This more rudimentary stove is built on the same principle as the three stones. In this case, there are four entries for the wood instead of three (only two out of these four are used for that purpose), but the housewives are just as satisfied as with the three stones.

In Tangué (Ouagadougou) one housewife uses a terracotta stove, while in Kalgodin (Ouagadougou) another housewife makes a fire in a pan that looks like a deep frying pan without a handle.

In semi-urban and urban centers, metal stoves are frequently used. In one district of Ouagadougou, seven out of 28 women interviewed used metal stoves for preparing stews in addition to the three stones on which the to, the rice or the couscous was prepared.

Of the 64 women observed at home, one uses a modern stove, and one uses a gas stove from time to time--when she has guests. Both are from Ouagadougou.

Where the Stoves Are Found

Aside from metal or earthen stoves which are movable, most of the time housewives use fixed stoves. Since they generally cook outside during the dry season and inside during the rainy season, most housewives have at least two stoves.

Out of 39 housewives who were observed in the Ouagadougou area, 19 cook in the courtyard for lack of a kitchen; 11 have a kitchen but often cook outside because the heat and smoke fill the kitchen hut; two their houses in order to stay out of the wind and rain --especially during the rainy season.

In Zura (Kongoussi, Northern Center), 24 out of 24 cook outside during the dry season, and during the rainy season three work under a shed and 21 in their houses.

Women's participation in the construction of the house and outer buildings

The 1975 national census indicates that 78 percent of the Voltaic people live in banco (mud brick) houses, 17 percent in straw huts, and only 3 percent in concrete or partial concrete buildings.

Eighty-eight point nine percent of the population own their houses. Only 3 percent rent their houses, mostly in urban and semi-urban centers.

Rural people build their own houses with assistance from the community, each one helping his neighbor as he has been helped before. Distribution of tasks by group and sex is found: men are responsible for staking out the house, the foundations, and the roofing, while women transport the banco, water, and bricks, and do the finishing work (leveling and flattening the ground, plastering, and decorating the walls). Of course the preparation of meals for the workers is also done by women.

Women also participate in the construction and finishing work for the grain storehouse; the grinding stone and its support; the attic; and, the stove for the karite commonly found in Upper Volta. For the grinding stone, for instance, the men often construct the brick walls, but the women gather the stones and the earth to fill up the enclosure, level it, and plaster it to prepare the working surface on which the millstones will be placed.

As for the stoves, they are put into place exclusively by women, often the housewives themselves, the mothers-in-law (often very old), or the sisters-in-law, according to the region. This is a custom which every construction program for improved stoves should take into account so that women are not robbed of a responsibility they have always had. Should that responsibility be taken away from them, it would only make them more dependent on men.

Durability and Maintenance of Traditional Stoves

As indicated above, only 3 percent of the population live in rented houses, which implies that the three stones used to cook on remain fixed in the same spot for generations and are passed on from mother-in-law to daughter-in-law. During the study most of the housewives said that they use stoves which were used by their mother-in-law. Some of the housewives have been using their stoves for 20 or even 30 years, so we can say that a correlation exists between the period during which a woman uses her stove, and her age at her wedding. This is why wives of Camp Guillaume soldiers told us: "We can't tell you exactly how old the stove is. But it definitely dates from our wedding, and when we move we will build another one."

Traditional stoves, however, require certain maintenance:

- * removing the ashes every day, every other day, or once a week (according to the housewives);
- * filling up the hole that is created when the ashes are dug out of the hearth;
- * washing the stones (Ipala/Kongoussi, Northern Center);
- * packing the stones or the clay pots with mud so that they cannot move;
- * replacing the stones or clay pots which have broken because of the heat;
- * building a wall to strengthen the stove, as in Dedougou or in Linoghin in the AVV; and,
- * making sure that children don't pour water on the burning stoves.

Maintained in this way, stoves may last for several (two to four) years without any repair.

Rites and Customs Related to the Stove

The stove is the symbol of family health. It reflects understanding and solidarity among those who use it.

When co-spouses are getting along well, they use the same stove without any problem.

In the Sahel, where the extended family still exists (as opposed to the nuclear family), five out of seven women use the same stove as their co-spouses. The two housewives who do not use the same stove are from Welde and Mamassiol.

In Ouagadougou, a housewife declared she does not use the same stove as the other wife of her husband because the other wife is messy. She never sweeps the area surrounding the stove during the two days she is in charge of it.

By contrast, the separation of stoves seems to be a standing rule in the region of Kongoussi, where every woman often has two stoves: the first constructed inside the house, often by the mother-in-law or the daughter-in-law, and the other stove, outside, often built by the woman herself.

In Fakena (Black Volta) as in Kongoussi (Northern Center), sharing the cooking responsibility between co-spouses did not exist in the families we observed. Every spouse cooks for herself and for her children every day, and prepares one dish for her husband.

In Bomborokuy, an old Bobo farmer said that the stove must never be constructed facing east but must always be oriented towards the west or the north. Nowhere else did we encounter this care of stove orientation which, in this case, must be related to the wind direction and sun exposure.

Even though in many villages (Bangasse, Goghin, Kombissiri, Dapoya, five out of seven villages in the Sahel, all Moslem) we were told that the installation of a stove requires neither sacrifice nor ceremony; we noticed that certain customs are practiced--such as killing a black chicken and pouring its blood on the stones of the stove(11), putting the excrement of hens in the middle of the stove(12), or preparing a special meal (to, pounded beans with okra, etc., which is then either served to the old people of the neighborhood, or eaten by members of the family, especially the elderly members and sisters-in-law). The meal is prepared by sisters-in-law or by the bride herself, for whom it is the first preparation of a meal.

(11) Mossi farmer from the Black Volta.

(12) Housewife from the Sahel (Mamassiol).

After the installation of the stove, which is synonymous with the start of a new family, the housewife gives pancakes or millet flour to a beggar every Friday.(13)

These last two practices bring to mind the meaning of sharing, which is firmly established in Africa, and of housewarming parties in Europe.

(13) A housewife from the Sahel (Dantiadi).

III. FUEL USED

Without a doubt, wood is the fuel used most. The use of wood in combination with other energy sources, and under certain specific conditions, is described below.

Wood

First of all, wood is used all year long (12 out of 12 months) in the cities and in certain parts of the Center, the Northern Center, and the Black Volta regions, while it is used only during a certain period of the year in major areas of the Northern Center and Sahel regions.

Families supply themselves with wood either by gathering it themselves, or buying it. Most people gather it themselves. It is usually gathered by the women and children. In certain villages we observed such as Bambofa, Malbo, Mamassiol and Kampiti, only men gather wood. It remains to be verified whether the men are heads of families, gathering wood for their spouses, or whether they are carrying out a wood-gathering task for another family.

For women, how often they gather wood and the distances they have to go vary according to the villages. The following table gives an idea of frequency and distance.

The most common form of transporting wood is by carrying it on one's head. Some privileged people have bicycles and carts, particularly in the Black Volta, in the vicinity of Kongoussi and of the AVV.

It should be noted that the amount of work involved depends on the availability or scarcity of wood, which determines the distance of the trip and the time devoted to collecting the wood. It also depends on the size of the family, on the woman's physical strength, and on the season, for there are periods (especially in May and June) during which women go and look for wood every single day, sometimes twice a day, in order to build up their stock for the rainy season. Looking for wood is a daily duty for the women who sell wood (in Dedougou).

In the city and in a number of villages, women buy all or part of the wood they use. As the cost of physical labor varies, so does the financial cost.

WOOD GATHERING DATA

Villages Families Distance Duration of Frequency Traveled Trips of Trips

CENTER

Lamzonda 10 persons 2 km 1 hour 7/week Mogtedo 8 " 2 " 2 hours 3/ " Village no.6 10 " 2 " 1 morning 1/ " AVV of the 8 " 3 " 2 hours 3/ " Bombore Linonghin VI 11 " 5 " 3 hours 1/month Ouedanghin 11 " 5 " 5 hours 4/week Komsilga 7 " 5 " the whole 5/ " morning Bissiga 15 " 7 " 3 hours 1/ " Koudiere 20 " 15 " 8 hours 3/ " Tange 13 " 75 " 4 days/hand 2/ " cart 1 day/truck

NORTHERN CENTER

Bayend-Fulgo 16 persons 2 km 2 hours 2/week Sawi 9 " 3 " 2 " 1/ " Tampedga 8 " 4 " 4 " 2/ " Mafoulou 6 " 5 " 3 " 2/ " Wintini 6 " 5 " 4 " 2/ " Looga 7 " 5 " 5 " 1/ " Selbouri 5 " 7 " 3 " 2/ " Baam 12 " 7 " 5 " 2/ " Baadnoogo 10 " 9 " 4 " 3/ " Zura 7 " 12 " 5 " 3/ "

SAHEL

Dantiadi 5 persons 3 km 3 hours 7/week Bouloye 6 " 3 " 4 " 3/ " Kampiti 8 " 5 " 3 " 3/ " Bambofa 11 " 5 " 5 " 2/ " Welde 7 " 5 " 7 " 1/ " Malbo 10 " 7 " 10 " 2/ " Mamassiol 12 " 22 " 13 " 3/ "

BLACK VOLTA

Brouyo 11 persons 1 km 3 hours 3/week Dionkongo 6 " 2 " 2 " 1/ " Moundasso 7 " 3 " 4 " 1/ " Dabe 8 " 4 " 5 " 3/ " Fakena 19 " 5 " 5 " 4/ " Pampoi 19 " 5 " 5 " 3/ " Bazakuy 36 " 6 " 6 " every day Bomborokuy 10 " 6 " the whole 2/week morning Trypano 10 " 7 " 5 " 3/ " Bandoukuy 12 " 10 " 8 " 4/ " Daka 6 " 10 " 9 " 2/ "

For a cart-load of wood, housewives pay 2,000 to 2,500 CFA in Dedougou, 2,000 to 2,500 in Kongoussi, 3,000 to 5,000 in Ouagadougou, and 400 to 700 in Dori (specifically Bambofa). In addition to these costs, there is an extra cost for chopping the wood (500 to 600 CFA for each cart-load in Dedougou and Ouagadougou). Prices rise during the rainy season. One cart-load may last between one and three months, depending on the size of the family and the housewife's thriftiness.

Monthly expenses for wood are up to 450 CFA in Kombissiri, 500 to 800 CFA in Cissin (Ouagadougou), 4,000 CFA in Kalgondin (Ouagadougou), and, for a large family living in the area of Ouagadougou which is being developed, up to 9,000 CFA.

In the Sahel, monthly expenses are 560 CFA in Bouloye and 280 in Malbo and Mamassid. These paradoxically low costs can only be explained by the combined use of wood and other fuels.

In any case, wood weighs heavily in the family budget, especially when one takes into consideration that in 1977 the SMIG (monthly minimum wage) was 15,637 CFA. A wage-earning head of household who had to support a large family in Ouagadougou therefore had to spend one-third of his monthly salary just to buy wood.

Millet Straw

Many women use sorghum/millet straw to light the fire or even to cook. This is how, in several villages of the Northern Center and the Sahel, fuel needs are met totally by millet straw for several months, especially during the dry season. A table covering use of millet straw in the four regions studied follows.

Other Vegetable or Animal Waste Products

In addition to millet straw, cotton and sesame straw are also burned in Dedougou, and cow manure is used in the Sahel, in Toece and in the development area of Ouagadougou, in the Center region. In Dantiandi (Sahel), certain women said that they use cow manure seven months out of 12.

In the Black Volta cow manure is not used for cooking, but it is used as fuel in the karite stoves and for firing pottery.

Millet straw and cow manure are not sold commercially, but are collected by women and children.

Charcoal and Gas

These are seldom used in rural areas except in the Sahel, where charcoal is used to prepare tea. Often the embers which remain afterward are used. Gas is rarely used, even in the city.

Women's Preferences

Women have strong preferences for particular types of fuel, for very specific reasons.

On the whole, they prefer wood because it permits fast cooking without burning too quickly and does not require constant watching. Many of the women interviewed consider wood to be the least expensive fuel, because, "We can easily find wood and we hardly have to watch the fire."

USE OF MILLET STRAW AS FUEL

Villages Picking Season Length of Use

Center

Bilbalogho Dry Season 2 months Komsolga " " 3 " Koudiere " " 3 " Lamzondo " " 4 "
Lougsi " " 4 " Samandin " " 4 " Bendogo " " 5 " Kalgondin " " 5 " Goghin " " 6 "
Kombissiri " " 6 " Toece " " 6 " Village No.VI " " 6 " Linoghin VI " " 12 "

Northern Center

Zura Dry Season 2 months Ignongo " " 3 " Ouemtenga " " 3 " Tampilga " " 3 "
Wapassi " " 3 " Winting " " 3 " Baam " " 3 " Balonghin " " 4 " Bangasse " " 6 " Wintini
" " 6 " Looga " " 7 " Selbouri " " 9 "

Sahel

Malbo Dry Season 4 months Mamassiol " " 5 " Welde " " 7 "

Black Volta

Bondoukuy Dry Season 3 months Lah " " 3 " Dedougou-Nouna " " 12 "

Millet straw is appreciated by housewives who use the ashes as fertilizer. But the straw burns too fast, requires constant watching, and emits a great deal of smoke. Cow manure has many of the same characteristics.

Cooking with charcoal is considered to be too slow a process, but it offers the advantages of emitting little smoke and being available for retail consumption. One can buy charcoal for 25 CFA, whereas wood at the same price is nonexistent in many areas.

One housewife interviewed asserted that gas allows fast and easy cooking, but that she prefers wood, probably because of the price.

Changes in Wood Availability, Techniques for Reducing Wood Consumption, and Other Recommended Action

The men and women interviewed have a very clear idea of the causes and consequences of trees disappearing. Elderly people note that in former times the distances traveled to get wood were not major. Today, wood is becoming scarce, due to:

- * large-scale gathering of wood made possible by the use of carts, and encouraged by increasing demands from the cities;
- * population growth and the clearing of land;
- * new needs for wood, such as garden fences;
- * brush fires and scarcity of rain, attributed by one old farmer to the abandonment of customs and the use of millet straw as fuel;
- * the increasing number of meals per day, from one to two, and even three; and,
- * the splintering of large families, which leads to excessive wood consumption. An old farmer from Bomborokuy (Black Volta) commented: "The small family is the cause of the disaster. These days, one cooks for only two people, while in our time every son who married stayed in the large family with his spouse. Their children used to be educated by elderly people who knew about life."

The consequences of this situation are well known. They are deforestation, drought and desertification.

In order to break this cycle, women and men practice and recommend the following precautions:

- * reduce the consumption of fuel by protecting the fire from wind (to do this, fill in the gaps between the three stones with pieces of pottery or metal);
- * prevent the wood from burning too fast by wetting it slightly when it is too dry;
- * put out live coals immediately in order to be able to use them later on; and
- * use metal instead of clay pots.

To increase the quantity of wood available, the people interviewed recommended:

- * outlawing open outdoor fires, with severe penalties handed down by the government (Kombissiri);
- * planting and protecting young trees;
- * extending reforestation Programs;
- * only one preparation for two meals each day; and,
- * the construction of improved stoves, which they have heard people talk about on the radio and have seen at the Dedougou fair and in certain households in Kaya and Ouagadougou.

IV. THE INTRODUCTION OF IMPROVED STOVES AND WOMEN'S ASPIRATIONS

Current Working Conditions

As for conditions under which meals are prepared, most of the women interviewed complained foremost about the smoke. Smoke is caused mainly by the traditional way in which the fire is started: embers are taken from a neighbor's stove and laid on the pile of wood between the stones--at first the wood smokes, then it breaks into flames. While the smoke eventually dies down, it never disappears completely.

To facilitate lighting the fire, many housewives use straws, paper, pieces of tire, or gas. They stoke the fire either by blowing on it, or by using cardboard, pieces of metal, a fan, a broom, etc.

Even women who have a kitchen prefer to work outside, to avoid the smoke.

Although smoke is mentioned as a primary discomfort in Black Volta and Northern Center, women in the Center and the Sahel regions complained about the heat almost as much as the smoke.

Watching the fire and the pot ranked third in the list of complaints, probably because it had been mentioned in the questionnaire. However, it was mentioned from the outset by several women in the Sahel, even before smoke and heat. This is probably because of the widespread use of millet straw, which burns fast and goes out easily, thus requiring that the housewife keep a close eye on the fire.

Elsewhere, watching the fire and the pot seemed to be a primary concern. To a lesser extent weather conditions, dust, burns and the work that is required to beat the to were concerns. (Wood gathering was not even mentioned.)

Prejudices Related to Smoke

Although most of the women complained about the smoke, only four of them specified that smoke hurts the eyes and provokes respiratory disorders (such as a cold or cough). The traditional education of the African girl involves learning a certain stoicism in regard to physical work and pain. For that reason, peremptory and severe judgements are passed on those who cannot bear the harshness of life in general and women's role in particular.

This is why a women's group in the Northern Center declared that "women in general are afraid of smoke, but no one dares say that for fear of being called lazy."

Two attitudes, very similar on the whole, grow out of this feeling of fear: one is condemnation, the other resignation.

Certain women have so well integrated the image that the society has of themselves, that they believe a good housewife does not have to be afraid of smoke because it is her duty to cook. A woman should not be weak, and if she is afraid of smoke, she is certainly a lazy woman counting on others to get fed. In fact, she is not really a woman, for the women who are afraid of smoke in the Kombissiri region have no breasts.

The group of those who are resigned share the attitude that it is normal to be afraid of smoke, but that they can't do anything about it. "A woman who is afraid of smoke is going to suffer, for she is doomed to cook, whether she likes it or not."

A woman's group of the AVV does not see any solution to this problem, for "all housewives are afraid of smoke because it is painful to the eyes. We think that a housewife who is afraid of smoke is going to suggest her whole life, because she was born in this situation and will die in it, too."

Use of the Smoke

Discomfort for housewives aside, people interviewed recognized that smoke also has some usefulness. It drives mosquitoes away, protects the beams of the house from termites, and protects the harvest (especially corn) from insects. The soot which appears on the walls and ceiling is used as a base for a medicine, which when mixed with karite butter, is used to cure hemorrhoids and to heal wounds.

Changes Desired in Meal Preparation Conditions

The question we asked on smoke allowed us to identify a certain attitude of powerlessness. We also found this attitude when we asked questions about changes women want to see in their working conditions. In the Center region (development areas of Cisin, Village III AVV) and the Sahel region too (Welde), groups of women said they did not want any change, because "long ago, our grandparents cooked and taught us how to cook. And we don't have to change anything."

In opposition to this ultra-conservative view, the majority of women strive for changes which overlap, but which can be classified in three categories:

- * changes to increase housewives' personal comfort;
- * demand for better working equipment; and,
- * secondary needs.

Improving housewives' personal comfort

Women do not want to get dirty and overly tired from cooking. That is why they think it is desirable:

- * to avoid sun and heat;
- * to avoid smoke and sore eyes;
- * to avoid burns, especially foot burns;
- * to reduce the consumption of wood, the time spent gathering wood, and particularly to ease the toil of stockpiling wood for the rainy season;
- * to be helped by the men in gathering wood, or even to delegate this responsibility to men;
- * to reduce the time spent beating dough;
- * to reduce meal preparation time so that there is time to do something else;
- * to be helped by a domestic;
- * to reduce fatigue caused by beating dough;
- * to reduce the length of trips to look for spices; and,
- * to have a kitchen with sets of shelves and a large window through which the smoke could escape.

With this last wish, expressed by rural women in the Black Volta, we focus on equipment demands.

Kitchen Equipment

In order to work in better conditions, women want to:

- * replace clay pots with aluminum;
- * have more modern utensils (pots, dishes, ladles) in order to prepare several dishes at one time;
- * replace the three stones with a stove that would guarantee the stability of the pots and let any smoke escape;
- * have some means of stoking the fire, and consuming less wood;
- * have a kitchen hut instead of having to work in the middle of the courtyard or in the house; and,
- * have, in the absence of a kitchen, a wall around the stove.

Secondary Needs

The answers we gathered indicate that women are very aware that improved stoves alone will not solve their problems. Also necessary are good access to water (well or running water), a grinding mill, and above all, the availability of food. (See RECOMMENDATIONS, No. 6.)

Improved Stoves: Acceptance and Availability

In the opinion of those interviewed (men and women), the introduction of improved stoves would be welcomed to ease the problem caused by lack of wood, and the difficulties of collecting and using it.

A women's group asserts: "We are in favor of the change. The improved stoves will help us considerably." This expectation goes along with the wish for success of improved stove programs. Groups expressed certain reservations and fears about the conditions necessary for the successful dissemination of improved stoves:

A. Some people indicated that they felt reluctant to declare themselves for or against the adoption of a stove that they have never seen. "They want to see the innovation and how successfully it works before expressing an opinion."

Moreover, it is imperative that the men agree, at least in certain villages such as Mamassiol, "because the men have the final say. The women do not take part in decision making."

B. Then, there is the fear that the switch from three stones to the improved stove may create problems. More explicitly, people are afraid that fires may start if the stove is incorrectly used, and that it will not be possible to beat the top on these new stoves. As women of the AVV said: "We only know the three stones, which means that we will have problems with other stoves."

In fact, "whatever is new creates problems." Thus it will be necessary to inform and to educate the women in the use and maintenance of the stoves.

Certain women's groups already know who will help them solve these problems: they will go to the social worker.

C. But the two prerequisites that people interviewed tend to consider as the biggest obstacles, are the financial investment and stove construction techniques. Some women's groups seemed to be able to overcome these obstacles with help from their husbands; support from women's associations, which joined together to buy materials (cement, iron); or from existing credit systems set up by organizations such as the ADRK and USAID for the purchase of small scale agricultural and domestic equipment.

Even if people are prepared to accept improved stoves, they are worried they will miss the opportunity of acquiring one due to lack of funds. This worry was expressed repeatedly, even in the most enthusiastic answers. The lack of money and the fact that "not all the men will be willing to give money to their wives" prevents many housewives--who would otherwise be quite inclined to adopt the improved stoves--from having one.

D. Aside from those reservations, people interviewed tried to describe the models of improved stoves they would like to have.

The materials they prefer are stabilized banco, cement, or metal. It seems that many women expressed the desire to be able to work standing up. Most of the women use stoves in which the three stones vary in height from 11 to 17 centimeters, with a maximum of 33 cm. (on ten stoves measured in the homes of female civil servants in Ouagadougou). The height varies according to the size of the cooking utensils. To beat the millet batter, they sit on tools which are between 14 and 25 cm. high.

The majority of women would like to be able to use two or three-preferably three--pots at the same time. In Ouagadougou, only two women asked for stoves with four holes.

The stoves should be supplied with chimneys, except in some rare cases where the oral description of the improved stove, without any visual support, made people think that the risk of fire would be too great.

Opinions are divided on the question of whether the stoves should be fixed or transportable. The women from the Northern Center and the Sahel would opt for a transportable stove if they were sure it would not break during the trip.

A question related to the size of the wood to be burned did not receive clear, concise answers, particularly because what are called short pieces of wood are between 50 and 75 cm. The fuel chamber opening requires pieces of wood that do not exceed 30 cm.

In the Center region, especially in Linonghin VI, women asked that the stoves be designed with work space and that the kitchen include ventilation openings.

Economic Evaluation, and Financing Improved Stoves

The cost of the improved stoves now constructed in Upper Volta ranges between 1,500 and 5,000 CFA for families and 9,000 CFA for institutions (boarding schools, hospitals, and so on). Compared with the small amount of money women make through small business and handicrafts, these sums seem very high.

There is little information concerning women's incomes, and we only tried to identify the types of income-generating activities women are involved in, and the level of income that they are presumed to reach in each. This attempt turned out to be not at all conclusive, since the rate of consumption at home of products for sale is very high; since the women have no accounting system and spend money as needs arise; and since, in general, they do not like to disclose how much they earn.

In the following table ("Income-generating activities of the women interviewed") elements we gathered are presented, which in our opinion are only stepping stones for a more systematic study.

Clearly, these low incomes do not enable the women to pay the installation costs of an improved stove. While they may believe that, according to the traditional division of duties, the expense is their responsibility, they recognize that the help of their husband or other male relative (uncle, brother, son) is indispensable.

In order to convince the relatives, a comparison should be made between the cost of an improved stove and the substantial advantages (savings of fuel, time, and human energy) that one is likely to gain.

Cost/benefit study of improved stoves. If we consider, first of all, the cost of purchasing wood, and the possible reduction of this cost by 40 to 50 percent, we can estimate that a family which buys 3,000 to 5,000 CFA of wood every month will recoup a 5,000 CFA investment within two to four months, with the possibility of saving between 10,500 and 17,500 CFA during the remainder of the first year's use.

In the Northern Center, the expenses we listed ranged between 1,400 and 2,500 CFA a month. A 3,000 CFA investment will be regained within three to five months, with the possibility of saving up to 5,000 or 9,000 CFA the rest of the first year. In the Black Volta, a family of 12 spends 2,000 CFA a month for its wood. A 40 to 50 percent cut in this expense would allow for an improved stove costing 5,000 CFA to pay for itself within five to six months, not counting the savings that would be realized afterwards.

Paradoxically, it is in the Sahel, where wood is scarce, that fuel expenses are the lowest. This is probably due to the area's low urbanization, its small population density, its diet, and the presence of dead wood after the drought. The monthly expenses for wood

MAIN INCOME-GENERATING ACTIVITIES OF THE WOMEN INTERVIEWED

Village Activity Home Income consumption (CFA)

Center

Koudiere, Linoghin Private fields, -- peanuts, peas, sesame, beans, okra

Koudiere Nut gathering -- and preparation of karite butter

AVV Village (VI) Cotton spinning --

Kalgondin (Ouagadougou) Cotton spinning -- 2,500/yr

Bendogo, Bombore Preparation and 500 to Kombissiri, Linoghin sale of Dolo 3,500/mo.

AVV Villages and Sale of lemon 1,500 to Paspanga (Ouagadougou) juice, soda, 2,000/mo. beer, matches, and cigarettes

AVV Village Reestablishing 500/mo. rice

Ouagadougou Small trade: coal 1,000/mo.

Ouagadougou Small trade: 1,000 to peanuts, fritters 2,500/mo

Ouagadougou (Gounghin) Cookies 7,500/mo.

Ouagadougou (Kalgondin) All sorts of 10,000/mo condiments

Goghin, Tanghin-Dassouri Market garden 15,000/mo

Center

Ouagadougou(Tanghin- Trade: loin-cloths 4 pieces/ 30,000 Barrage) and foulards year to 35,000/ year Kongoussi Millet, peanuts, sesame, potatoes, beans

Kongoussi Dolo prepared from 7,000/yr millet cultivated in private field

Kaya Preparation and 750 to sale of Dolo 2,000/mo

Kaya Restablishing rice 350 to 1,500/mo Kaya and Kongoussi Cotton spinning 2 to 4 loin cloths/yr

Badnoogo (Kongoussi) Pig breeding 15,000/ year

Sahel

Dandiadi, Mamassiol Market gardens 1,000/yr and condiments

Banbofa Small trade: 50/day peanuts

Bouloye Wicker work 1,000 to 1,500/mo

Mamassiol, Kampiti Cotton spinning 1,500 to 4,500/yr

Banbofa, Kampiti Hair-cutting 100 to 300/week

Bouloye Small scale 5,000/year breeding (sheep, goats) Black Volta

Bondoukuy, Private field: 5,000 to Brouyo millet, peas, 10,000 in peanuts

Bondoukuy, 15,000 in Brouyo

Bondoukuy Market garden 41,000/month

Pompoi Small trade 13,000/month

Lah Almonds and karite 13,000/month butter

Bomborokuy Sale of peanuts, millet, corn, peas 2,000/month

Bomborokuy Wicker work (mats)

Trypano area Cotton spinning 4 to 5 8,000 X 5 = (Dedougou) blankets a 40,000 year

Bondoukuy Hair-cutting 2,000 to 2,500/week

Pompoi Production and sale 500/month of soap

Bomborokuy Wood trade 500/month

Bomborokuy Small scale breeding 20,000/year of Guinea fowl and sheep

Bomborokuy Small scale breeding 5,850/year of bees and sale of honey

are between 400 and 500 CFA, which probably represents purchases of wood to supplement wood gathered. If we take into account this outlay alone, it would take 10 to 15 months to regain the investment that the installation of a 3,000 CFA improved stove entails. If one recalls that it is in the Sahel that women seem to earn the least, one has to admit that the financial commitment required by women in the Sahel will have to be greater than in the other regions.

Time and energy savings, and economics and social activities envisaged. If improved stoves are really efficient, they will almost certainly reduce wood consumption, reduce the time normally devoted to collecting wood, and therefore, reduce fatigue.

Reducing cooking time will give women more free time to do other things. But this new opportunity should be approached carefully, so that the reduction in cooking time is not confused with hasty or insufficient cooking of dishes. This having been said, women plan to employ their free time for very specific occupations:

* resting, for their work is hard, especially in the rural areas. But since they have been educated to "endure patiently," this specific wish is never mentioned by itself. They want to relax but also to do other things, as listed below;

* visiting friends or relatives;

* performing certain domestic tasks which they feel they are not able to carry out the way they should for lack of time: pounding millet, looking for water and wood (!!!), sweeping the compound, washing and mending clothes, watching and taking care of the children(14), fixing their hair, or helping their husbands in the field;

* undertaking activities in the hopes of making some money: cotton spinning, sewing, knitting, weaving, taking care of the family field to produce more food, staying in the market to sell vegetables and spices, getting involved in a small business or fishing(15).

(14) One woman from Ouagadougou said she would like to go to the children's health center without being obliged to eat at two or three in the afternoon.

(15) In Bam, Kongoussi.

* participating in educational activities such as handiwork (sewing, knitting), literacy programs, child-care, discussions, etc.

It goes without saying that the development of this last group of activities could increase women's incomes and give them the opportunity to pay back a possible loan, and contribute to the improvement of the family's situation.

V. CONCLUSIONS

1. Some women's groups interviewed in the Center (Paspango/Ouagadougou Village III--AVV) and in the Sahel (Malbo, Dantiadi) had the impression that the investigators asked questions out of simple curiosity. Other women were rather amused, and felt it was a waste of time answering the questions.

It must be pointed out that for some time women from the Sahel have been subject to all sorts of studies, yet they have never seen any results or follow-up. One woman responsible for the women's training center in Dori quipped that, "the study asked women if they wanted to go to the moon."

1. We must recognize that this assertion applies in part to the questions asking women to describe the kind of improved stoves they would like to own, when they had never even seen a model of an improved stove, at least not a modern one.

2. But even in the neighborhoods or villages in which women don't seem too optimistic about follow-up to the study, those interviewed made it a rule to answer the questions, and the majority were happy to see that their domestic problems are taken very seriously and that attempts are being made to solve them.
3. In most of the cases a relaxed and frank dialogue took place between the housewives and the interviewers. According to some of the people who conducted the study, they got to know the "family life" of the people, and also found that certain housewives were "clean and well organized."

Sometimes they learned recipes that were new to them and their presence inspired some housewives to cook dinner earlier in the day and to take better care of the children (bathing smaller children every day after play time, for instance).

The study has improved communication between women living in rural areas and social workers, something which will be of great benefit in the event of future dissemination of improved stoves.

1. The women interviewed in general, and housewives observed at home for a week in particular, would like to have an improved stove in the house. At this time, they are afraid of not being in a position to make the necessary investment.

One old woman from Ouagadougou explained with much humor just how impatient the women are to use improved stoves: "I want to see improved stoves before I die, so I can tell my ancestors all about it." The first improved stoves already constructed in Ouagadougou should dispel these doubts.

1. Although the study dealt essentially with women's activities, some women hesitated to answer the questions without their husband's opinion. Men's opinions were sometimes in the form of encouragement, but were sometimes opposed to any change in current cooking conditions, even though women want such changes. This will have to be taken into consideration, since the man's decision and his cooperation in the building of improved stoves are indispensable.
2. Most of the people interviewed--men and women--offered their best wishes for the success of the program, and expressed their support for those who design and build stoves, relieving women of work and improving their families' living conditions.

The study appeared to be a very efficient means of making people aware of problems such as use of wood as fuel, deforestation, and desertification. But it also made people aware of women's issues to such an extent that they would willingly adopt a phrase like: " Let's conserve wood and replant trees, to help our families and save our country."

VI. RECOMMENDATIONS

1. In order to maintain the interest and hopes that the present study raised, it is important that this report be reprinted as soon as possible, and that as many copies as possible be distributed to all concerned parties: services and organizations, those who carried out the study, and those who were studied.
2. Preparation for Phase II of the study (November-December 1980), would be a good opportunity to bring back all the interviewers, in order to discuss future action with them.
3. Meanwhile, improved stoves should be constructed in places chosen by the people: urban and rural social centers, maternal and child care centers, centers for young agriculturists, or in the homes of social or women's leaders, and so on.
4. In order to respond to the high demand probable for installation of stoves, a plan for construction of improved stoves should be drawn up. This plan should have the agreement of the people involved, and be structured as follows:

- a) Training young villagers designated by the people of the village;
- b) Defining how these young villagers are going to be employed and who is going to be responsible for them; c) Searching for methods to finance the improved stoves (materials, payment for construction and maintenance, etc.);
- d) Giving information to the women trainers and social workers, who will pass it on to the new users;
- e) Training programs for craftsmen and those using the stoves should not teach only rote knowledge, but instead give practical and theoretical information to encourage reflection and to stimulate imagination and initiative. This process is indispensable for a flexible, permanent bond between people's responsiveness, the construction of stoves, their use, and improvement.
- f) In order to be effective and really assist women and people in general, an improved stove program should be integrated with other programs aiming to satisfy other priority needs. An ideally integrated program could be: A program of food self-sufficiency + wells + a mill + reforestation improved stoves.
- g) The most appropriate means for ensuring the success of these programs are the services and organizations which participated in this study, as well as non-governmental organizations involved in timely integrated rural development programs in the regions studied.

ANNEX

ANNEX I GEO-CLIMATIC AND ECONOMIC

ANNEX II PEOPLE CONSULTED

ANNEX III VILLAGES STUDIED, INTERVIEWERS, AND PARTICIPANTS--CENTER REGION/ OUAGADOUGOU

ANNEX IV VILLAGES STUDIED, INTERVIEWERS, AND PARTICIPANTS--NORTHERN CENTER REGION/KAYA

ANNEX V VILLAGES STUDIED, INTERVIEWERS, AND PARTICIPANTS--SAHEL REGION

ANNEX VI VILLAGES STUDIED, INTERVIEWERS, AND PARTICIPANTS--BLACK VOLTA

ANNEX VII QUESTIONNAIRES A, B, AND C

ANNEX I

GEO-CLIMATIC AND ECONOMIC INFORMATION

REGION SURFACE POPULATION DENSITY RAIN PRINCIPAL (square km)
(MILLIMETERS) CROPS

CENTER 21,972 944,706 43.0 1,064.0 Karite, nere tamarind, detarium, (local species)

NORTHERN 21,598 632,285 29.3 456.0 CENTER

SAHEL 36,889 354,079 9.6 421.9 Neem, cassia, eucalyptus, qwelima (exotic species)

BLACK VOLTA 33,126 635,760 19.2 404.6

ANNEX II PEOPLE CONSULTED

Mrs. Fatimata Traore, Minister of Social Affairs and Women

Ms. Isabelle Bouda, Staff Director of the Ministry of Social Affairs and Women

Mrs. Sounbalo Sanfo, Director of Women's Affairs

Mr. Cheick Kabore, Director of Research and Programs, Social Affairs

Mrs. Maimouna Traoret, Director of the EPFED Project and President of the Voltaic Women's Federation

Mrs. Christophe Ouattara, Departmental Director of Social Affairs (Kaya)

Mrs. Marie Blanche Ouedraogo, Departmental Director of Social Affairs (Ouagadougou)

Mr. Zida, Office for Research and Programs, Social Affairs

Mr. Salia Sanon, Permanent Secretary of the Ministry of Rural Development

Mrs. Ouedraogo, Provisional Director of the National Office for the Furthering of Women's Affairs

Mr. Ouedraogo, Director of the ORD, Norther Center

Mr. Botini, Director of the ORD, Black Volta

Mr. Jacques Saou, Advisor FJA, Provisional Director of the ORD, Sahel

Mr. Jean-Baptiste Some, from the district of Dori

Mr. Sylvestre Ouedraogo, Director of Reforestation and Forestry Management

Ms. Clarisse Yameogo, Head of the Office of Domestic Economy, AVV, Ouagadougou

Mrs. Therese Zoungrana, Director of the Women's Technical School, Ouagadougou

Mrs. Da, Director of the Women's Handicraft Training Center, Ouagadougou

The Director of the Private Social Center of Dori

ANNEX III

VILLAGES STUDIED, INTERVIEWERS AND PARTICIPANTS--CENTER REGION/OUAGADOUGOU

Number of families observed: 35

Number of women who participated in group interviews: 999

Regional categorization: Social Affairs, Mrs. marie Blanche Ouedraogo, Regional Manager; EPED: Mrs. Maimouna Traoret: National Coordinator of the project

Regional Staff:

Mrs. Fatimata Batta, Head of the Office of Appropriate Technology and Domestic Economy

Mrs. Solange Nignan; Head of the area

Mrs. Brigitte Ativon; Home Economist

AVV:

Ms. Clarisse Yameogo, Home Economist

Mrs. Hawa Ouedraogo, Home Economist

FFD:

Mrs. Elise Kompaore, AT

ETF:

Mrs. Colette Nikiema, Technical School for women

Mrs. Da, Women's Training Center at Gounghin

Mrs. Vokouma, Women's Training Center at Gounghin

ANNEX VII (cont.)

C. Village Leader Interview

IDENTIFICATION

Village/district:

Date of interview:

Name of interviewer:

Office/organization:

Name and first name of the person interviewed:

Sex:

Age:

Occupation:

Ethnic group:

1. Do the people have as much wood for cooking at the present time as they have had in the past?
2. How do you explain the changes?
3. Are there changes in the way people used to feed themselves and prepare meals?

What changes?

1. Which precautions should women take in order to reduce the consumption of wood?
2. Are there other alternative responses to the current situation?
3. Will the introduction of stoves different from the three stones cause any problems? What?

4. What advice would you give to those who want to construct improved stoves?

* construction materials: Banco? Stabilized banco? Cement?

* number of holes to set pots in at the same time

* with or without chimney

* utilization of short or long wood

* other

1. Are there any associations of women or youth in the village/area?

2. What part could these associations of women/youth play in an improved stove construction program?

3. Is it necessary to teach every family how to construct its own stove, or is it better to train craftsmen to construct stoves?

ABOUT VITA

Volunteers in Technical Assistance (VITA) is a private, nonprofit, international development organization. VITA makes available to individuals and groups in developing countries a variety of information and technical resources aimed at fostering self sufficiency--needs assessment and program development support; by-mail and on-site consulting services; information systems training; and management of long-term field projects. VITA promotes the application of simple, inexpensive technologies to solve problems and create opportunities in developing countries.

VITA places special emphasis on the areas of agriculture and food processing, renewable energy applications, water supply and sanitation, housing and construction, and small business development. VITA's activities are facilitated by the active involvement of VITA Volunteer technical experts from around the world and by its documentation center containing specialized technical material of interest to people in developing countries.