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ASPECTS
OF
DEVELOPMENT

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SOME ASPECTS ON THE USE OF FUELWOOD AND CHARCOAL
IN SOMALIA

Introduction

During the 1970s there were two main energy crises concerning the Third World countries. First, the oil crisis which seriously affected the payment balances of many industrial countries as well as most of the developing countries. And second, the fuelwood crisis which may be called the real Third World energy crisis. It is especially a crisis for the poor people. In general, its consequences are known very well: ecological damages which often lead to desertification on the one hand, and social and economic problems for the respective population on the other.

What about these problems in Somalia? Are there any wood-fuel shortages? To what extent do they arise? Which are the concerned regions and locations? In which way is the population affected, and which are the environmental consequences? It is impossible to give a complete or even detailed answer to these questions up to now. Due to lack of data even general informations about the energy situation in Somalia mainly depend on estimates. This paper is mainly based on some reports about the energy situation in Somalia (Openshaw 1982; Engergy/Development International 1982) complemented by a few own impressions gathered during a short stay in Somalia in March/April 1983. The paper is divided into four sections. First I give an overview about the energy consumption in Somalia and some general informations about demand and supply of woodfuel. The second part deals with some aspects of woodfuel shortages

presented by a few examples of the most seriously affected areas. The third part will be a short discussion of possible solutions. And in the last part I will present a summarized proposal of a fuelwood and charcoal survey I intend to do in Somalia.

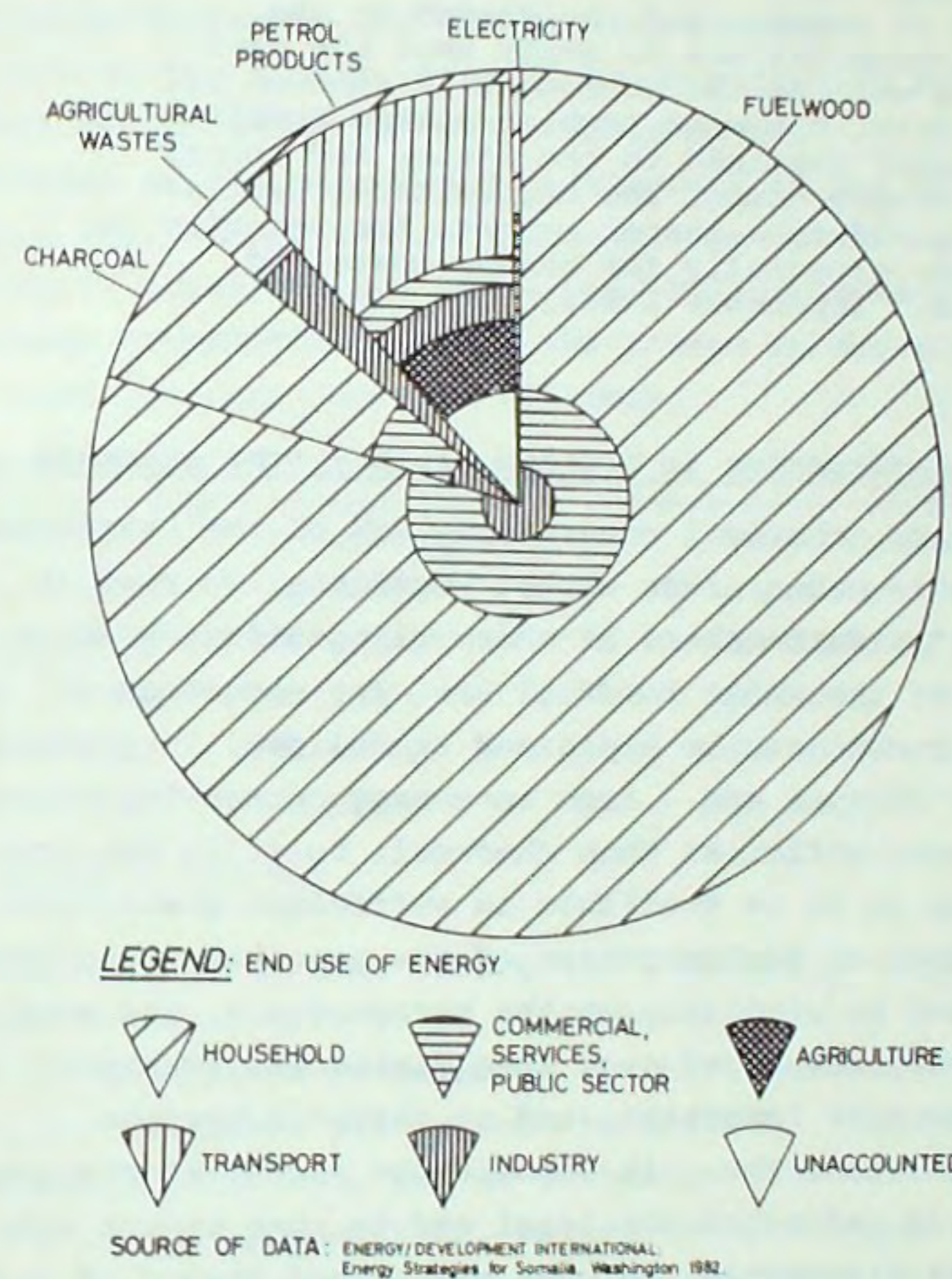
The energy situation in Somalia

Figure I shows the estimated energy consumption in 1980 by fuels and by end use of energy in units of terajoule (1 TJ = 10^{12} joule). About 80% of the whole consumption is covered by fuelwood. In addition, charcoal constitutes another 6.5%, whereas the share of petrol products is 11.5% in total, that of electricity is only 0.3%.

The end use of energy shows a comparable picture. More than 80% are used as household fuel, while the uses for transport as well as for the commercial, service and public sector lie between 6 and 7 per cent each, and the amount of energy use in industry is less than 3%. Comparing both, fuel and end use, one can see that about 94% of fuelwood and 85% of charcoal, but only 5% of petrol products are used as household fuels. So households are dominating the demand of energy, and they mainly use woodfuel, whereby fuelwood is mainly a rural fuel, and charcoal is almost exclusively an urban fuel (Openshaw 1982:5).

An estimate for the supply of wood and the comparison between supply and demand of wood products can be taken from Openshaw (1982:8-10), who estimated a total growing stock of forest, woodland and bushland of approximately 800 million m^3 . If an annual yield of about 2.5% of the total growing stock can be assumed, the estimated yield would be approximately 20 million m^3 , whereas the estimated demand of wood-fuel is only a bit more than 5 million m^3 roundwood equiva-

Figure I. Estimated Energy Consumption in Somalia by Fuel and End Use, 1980 (Unit: Terajoule)



lent. Considering that 10% of the whole wood consumption are needed for other uses than fuel, the total consumption of wood is about 5.8 million m^3 - much less than the total supply. As noted above, these results are only based on estimations and therefore should be used very carefully.

But even if the real figures differ to some extent, it can be pointed out, that today there are no general shortages of woodfuel in Somalia. But nevertheless,

"shortages occur where there are concentrations of people, and the demand on the tree resources are so great that the capital as well as the increment is removed ... Therefore, the wood problem facing Somalia is mainly confined to the cities and towns, the refugee camps, the agricultural settlements, and to a lesser extent, the watering points, especially for sheep, goats and cattle." (Openshaw 1982:10)

The woodfuel situation in problem areas - some examples

In units of TJ, charcoal covers only 25% of the estimated consumption in urban areas except Mogadishu, whereas in Mogadishu itself the share of charcoal constitutes about two thirds of the whole woodfuel use. The occurrence of these differences can be explained as follows. In general, fuelwood is cheaper and - from an energy conserving point of view - more efficient than charcoal. So it is the usual fuel as long as it is available in sufficient quantities. But the bigger an agglomeration of the population and the less fuelwood is available in the surroundings, the more fuel must be transported over long distances. Transport costs become more important, and so charcoal becomes cheaper than wood. Thus, in Somalia the amount of charcoal use can be an indicator for local and to some extent also for regional disparities between supply and demand of woodfuel.

Production, transport and sale of charcoal are mainly done by cooperatives. In the regions Bay, Baqool, Hiran, Lower and Middle Shabelle, and Benadir, the production takes place in 114 charcoal camps belonging to the cooperative Cadceed. More than half of the camps are located in the Bay region.

Usually 15 up to 30 permanent workers are occupied in each camp. The produced charcoal is transported to the place of destination by Cadceed and handed over to the local consumer's cooperatives. In Mogadishu there are 342 charcoal stores belonging to the cooperative Hilaac. Up to now, the amount of woodfuel shortages in Mogadishu cannot be specified directly. One possible indicator of such shortages is the amount and development of the prices. But only a few, rather inexact informations about the charcoal prices in Mogadishu are available. By informations of the charcoal cooperative Cadceed the prices in Mogadishu during the last ten years were as follows:

period	official	black market
1973 - 1975	18 SoSh/qintal	30 SoSh/qintal
1975 - 1976	20 SoSh/ "	60 SoSh/ "
1976 - 1978	25 SoSh/ "	80 SoSh/ "
1978 - 1980	30 SoSh/ "	100 SoSh/ "
1980 - 1981	50 SoSh/ "	180 SoSh/ "
1981 - 1983	70 SoSh/ "	300 SoSh/ "

(1 qintal = 100 kg)

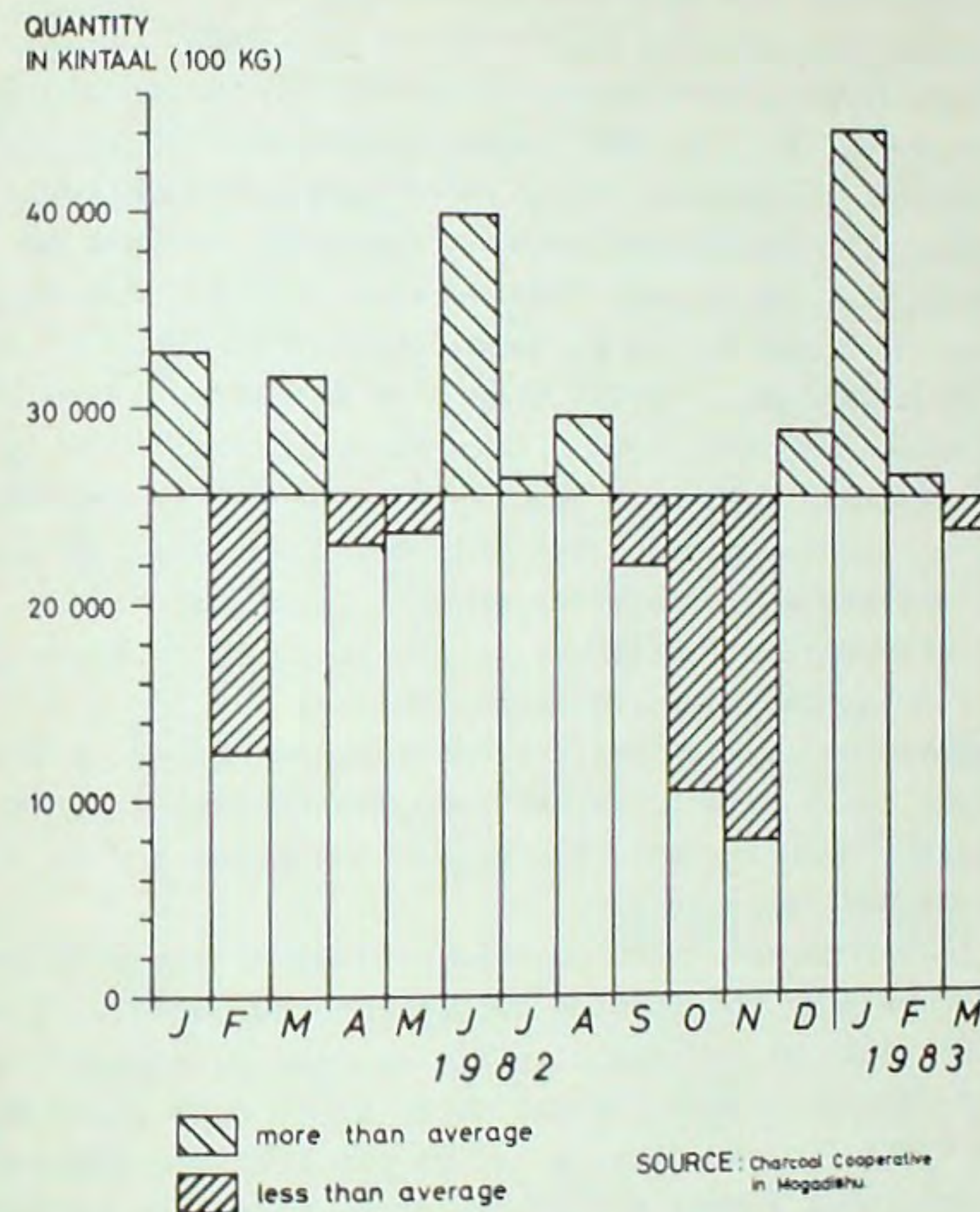
The rise of the prices during the last ten, and especially during the last five years, and the increasing discrepancy between the prices recommended by the cooperative and the given black market prices seem to indicate a growing shortage of charcoal. But no definite statement is possible by only these informations, unless the inflation rate during this period is not known. Furthermore, these figures do not give any informations about the seasonal differences of the prices, about the influence of the quantities bought on the paid prices, and about the percentage of charcoal sold in the cooperative stores and sold on the legal free market and on the black market.

For June 1982, Openshaw (1982:34-35) gives a price of 175 SoSh per qintal in case of buying big quantities of charcoal and a comparable price of approximately 400 SoSh per qintal, if only a few pieces are bought. Although there are supposedly price differences due to the quantities bought, these figures are nearly useless. He compares a small amount bought on the market with a big amount bought in a cooperative's store, without considering that the cooperative's charcoal is sold with fixed prices, no matter what quantities are bought.

As mentioned before, most of the charcoal production is done under control of the cooperative Cadceed, but nobody really knows the share of charcoal that is produced by private persons. But there seems to be a growing number of private charcoal producers. At the beginning of April 1983, between Jowhar and Bulu Burti, sacks of charcoal could be seen at most of the villages along the road. For example, at one of these villages 40 sacks of charcoal were offered by 8 different persons, all of them peasants who started producing charcoal two years ago due to the rise of the charcoal prices. One sack was usually sold for 80 SoSh either to private consumers or to dealers who resell most of it in Mogadishu.

Are there also seasonal differences in the supply of charcoal enlarging the supposed shortages? Figure 2 shows the amount of charcoal monthly transported to Mogadishu by Cadceed. Notable differences can be seen between the dry and the wet seasons. Especially in the dry season 1982 (October and November) the amount was very low. The main reason for these differences is the transport problem due to the heavy rainfall in the rainy seasons. At the same time most of the peasants producing charcoal additionally to the cooperative are busy on their own fields, and so the amount of charcoal offered by peasants may also be lower than in

Figure 2. Monthly Quantity of Cooperative's Charcoal transported to Mogadishu, January 1982 - March 1983



dry seasons.

After these examples for the energy situation in Mogadishu, I come to the second kind of problem areas, the refugee camps. In Somalia there are more than 30 refugee camps in seven different areas. Even today they cover an estimated population between 400,000 and 700,000 persons.

By assertions of some residents in the Jalalaqsi camps, fuelwood could be found in the nearest surroundings of the camps five or six years ago. But today all trees and bushes around the camps are cut off, and people have to go distances of ten or more kilometer to find enough fuelwood. Even more serious is the situation in the camps close to Belet Weyn. In July 1980 people had to move up to 40 km for the collection of fuelwood (Lewis/Wisher 1981: I3). Since then the situation even worsened, so that in some camps the scarce vehicles and even scarcer rations of diesel or gasoline had to be used to bring fuelwood to the camps (Lewis/Wisher 1981:I3). The same situation arose at the camps of Qoryoley. People have to go more than 10 km to collect their fuelwood. That is why only an estimated 10% of the camp population are collecting fuelwood by themselves, whereas a big majority buys it from businessmen. It is estimated that a family has to pay about 25 SoSh per week for fuelwood (personal communication).

These shortages are seriously affecting the host population around the camps as well as the refugees themselves. But especially concerning the host population there are no informations available at all.

Due to these enormous problems and ecological damages, the Somali government and foreign donors reacted quickly. First, different kinds of mud and clay stoves were introduced and are used instead of traditional three stone open fires in all the camps. In addition, a lot of projects are started to improve these stoves and to train the people in building up clay stoves by themselves. Depending on the kind of stove, it is possible to conserve 30% to 50% of the fuelwood needed for cooking at an open fire. Second, in July 1981 afforestation projects for the refugee camps were started under the responsibility of the National Refugee Commission and the National Range Agency in cooperation with different

foreign donors. The main purpose of these projects is the constitution of fuelwood plantations. The projects are divided into two phases. In the first phase - from July 1981 up to July 1982 - different species should be tested, while in a second phase - with the help of these experiences - the projects were to be extended over larger areas (Somali Democratic Republic 1980:III-I56).

Visiting the project at Qoryoley in March 1983, the tests were not yet finished. It was impossible to get any definite results about the yields and the efficiency of different kinds of trees within such a short period. At that time the project was somewhere between the first and the second phase, still continuing with tests and starting to enlarge the planted areas. Different imported fast growing trees, such as leucaena leucocephala, different kinds of acacia and eucalyptus, and some local trees, such as nim, are tested in the main. Most of these trees can be utilized for fuelwood after only two or three years. But, on the other hand, they require very much water. Additional irrigation must be applied for at least half a year. And up to now, no experiences exist as to planting fast growing trees over longer periods. At the project in Qoryoley about 100 ha were planted or prepared, ready for planting in March 1983. In the long run, it is intended to expand the planted areas up to 400 ha or 600 ha, which should be enough for about 60.000 refugees.

Possible solutions

Possible solutions can be subdivided into three approaches: energy conservation, increase of energy supply and improvement of the transport system.

Energy conservation

The attempts in fuelwood conservation by introducing and

improving mud and clay stoves, as already practiced in refugee camps, are a first step in the right direction. In the future, those projects should also reach the host population near the refugee camps and the peasants in agricultural settlements who still use open fires. Furthermore, investigations should also be made to find out if fuelwood and charcoal could be saved even in towns and cities by improving the existing stoves. Attention should be given to the improvement of charcoal production too. Up to now it was assumed that charcoal is produced throughout the country with traditional, rather inefficient methods. But a project which has the aims to measure the efficiency of the charcoal production and, if necessary, to improve the production techniques, already started in April 1983 in the Bay region, may lead to differing results.¹

Increase of energy supply

For the increase of energy supply, there is a wide range of possible actions, like the increase of woodfuel production, the conversion of agricultural wastes into fuels like coke or gas, the use of other renewable energy, and the increasing use of fossile fuels. But only the first action mentioned is useful to satisfy the household's main energy demand. Up to now it is not known, if the conversion of agricultural wastes into fuels is practicable from an economic point of view. The use of other renewable energy, such as wind and solar power, requires a better adaptation to the situation in Somalia. Besides, these energy sources are better suited to produce electricity, whereas in the foreseeable future the main energy required by households is any kind of fuel. And the use of fossile fuels would be meaningful only, if they could be found in Somalia itself. Otherwise it would burden the payment balance and enlarge the dependence on foreign countries unnecessarily. As noted above, the founding of fuel plantations was started

two years ago, in order to provide the refugee population with fuelwood. To meet the increasing demand for woodfuel, especially in the towns and cities, it will be necessary to establish fuelwood plantations for this purpose. However, such a far-reaching expansion of wood plantations as recommended by Openshaw could lead to other problems. He assumed that in the year 2000 at least 75% of the whole woodfuel demand in cities and towns, agricultural settlements and refugee camps should be taken from plantations and woodlots. And he estimated that an area of 0.6 million ha would be necessary for this purpose (Openshaw 1982:15-16). In order to minimize the transport costs, these areas must be close to the centres of demand. In consequence, land use conflicts and conflicts about the usage of the limited water supply would occur.

Improvement of the transport system

As local shortages are often a problem of transport only, some efforts should be made to improve the transport system. Especially in refugee camp areas it is necessary to introduce an adequate transport medium. Refugees mainly collect their fuelwood on foot or buy it from businessmen, transporting the wood with lorries. But in the refugee camps I visited I did not see any donkey cart used for fuelwood transport. The use of donkey carts or camels could not solve the problems of shortage in the long run, but it could at once mitigate the continuing ecological damages. People who are transporting wood by themselves can only take limited quantities. They need only one tree or a few bushes for one collection, and because the transport is the hardest part of their work, they try to minimize the transport distances. Therefore they cut off all trees and bushes close to the camps. Even the young species with little efficiency are used as fuel. In opposite, people using a donkey cart are not only able to go for longer distances;

they are also able to transport bigger quantities. Therefore, they are looking for greater agglomerations of wood. Young inefficient trees are of less interest and will not be cut. And so the complete cut off of an increasing area around the camps could be stopped. Furthermore, a few people using donkey cart could be easier encouraged to take care of ecological problems than a lot of people collecting on foot, who are unable to stop ecological damages - even if they would like to do so.

Summarized proposal on a woodfuel survey

The former presentation leads to the point that it is impossible to make any definite statement about the energy situation in Somalia up to now. There are not even reliable and detailed informations about some single aspects available. Therefore - although necessary for different purposes - it is not possible to draw up a national energy balance for Somalia unless a lot of basic empirical work will be done. This research work has to be started with case studies on the lowest level. It must not only lead to more exact data, but also deal with methodological problems in collecting data in Somalia. And, last but not least, the reliability of the data and possible sources of errors that will be inevitable at the beginning should be discussed very comprehensive.

With a survey about the production, marketing and consumption of woodfuel in Mogadishu, I intend to do one small step to get some more reliable informations about different aspects of the energy situation in Somalia.

In a theoretical part I intend to work out a framework of a national energy balance for Somalia that should be filled with data in the long run. Such a national energy balance must be useful at least for the following purposes:

- to determine actual supply/demand imbalances;
- to provide supply/demand forecasts with reliable data;
- to be a useful basis for plannings in the energy sector.

An energy balance that should meet these purposes must not be a merely comparison of energy supply and demand on a high level of aggregation. As shortages in Somalia are supposed to occur on lower levels, for example in certain locations or for certain groups of the population or for special economic sectors, an energy balance should be disaggregated to such a low level.

The empirical part of my survey bases on the hypothesis already named above. On the one hand today and in the foreseeable future there will not be any woodfuel shortage for Somalia as a whole, on the other hand there do probably occur increasing shortages at least on the local level.

With an estimated 10% up to 15% of the total population of Somalia, Mogadishu is not only the largest agglomeration of the population, but also the most important consumption area. It is assumed that Mogadishu is one of the major problem areas, concerning the woodfuel supply. And due to the rapid increase of its population, occurring woodfuel shortages may even become more serious in the future. The information of my basic questions can be divided into three parts:

- I. Supply of woodfuel - From which areas is Mogadishu supported with fuelwood and charcoal? Did these areas change in time? It is assumed that especially the centres of the legalized charcoal production by Cadceed moved farther and farther away from Mogadishu during the last eight or ten years. If so, what are the reasons for this change? Was there any far reaching process of deforestation in the areas closer to Mogadishu or is it only an action against deforestation, a temporal stop until the vegetation has regenerated and the production can be

started again?

What about the charcoal production by private persons and the collection of wood? The number of private producers seems to grow rapidly, and they produce in the areas which are not or no longer suitable for the production by Cadceed. The collection of wood is mainly done in the areas closer to Mogadishu. Who are the charcoal producers and the wood collectors and which are the exact production/collection areas? Do these people care about ecological problems? Is there any control in order to prevent a process of deforestation or is it a totally uncontrolled and unguided production and collection?

2. Transport and marketing system - While there are at least a few informations available about the transport and marketing of the cooperative's charcoal, almost nothing is known about the other parts of the marketing system. Which are the different components of the marketing system, who are the people engaged in woodfuel trade, and which connections and dependent relations are existing between these components?

A very important aspect is the development of the woodfuel prices. How did the prices change in time, which are the price differences between the single components of the marketing system, and which are the factors influencing the price structures?

3. Consumption of woodfuel - The third aspect of my survey is the consumption of woodfuel. As named above, charcoal is the most important household's fuel in Mogadishu. But nobody actually knows the real percentages of fuelwood and charcoal used. And nothing is known about the kinds of fuel used by different groups of the population and the factors influencing the quantities used. The crucial point of this part of the survey is to get the consumption figures for private households in selected areas of Moga-

dishu. These areas should be somehow typical for Mogadishu, but due to a lack of other informations, such as an economic differentiation of the population, it is not intended to get data that are representative in a statistical way.

This survey will not lead to a complete picture about the woodfuel situation of Mogadishu. It should be rather seen as the beginning of a research work that has to be done over a longer period.

FOOTNOTES

- I Project under CDA (Corporation for Development of Africa), a program in cooperation with the National Range Agency, done by Alan Robinson. His preliminary results lead to the point that the charcoal production in the Bay region is far more efficient than anybody imagined up to now.

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