

COST OF FUELWOOD FOR FISH SMOKING AROUND KANJI LAKE AND ECONOMIC PROSPECTS OF THE KANJI SOLAR TENT FISH DRYER

By OLOKOR, J.O

National Institute for Freshwater Fisheries Research

P.M.B 6006, New Bussa, Niger State

ABSTRACT

Fish is a very nutritious source of protein but it is extremely perishable, hence the need for quick preservation. Many methods are employed in its preservation. Around Kainji Lake, the most popular method is by smoking with fuel wood. Kainji Lake generates over 13,375 metric tonnes of fish annually, which requires smoking. This study shows that the demand for fuelwood to process fish is very high. Seventy-six fish processors in four major fishing communities around Kainji Lake were interviewed with questionnaires to determine the amount, cost and species of wood used for fish smoking. Results from the study show that about 396,250kg of wood costing N1, 325,000 is used to smoke 189,883kg of fish worth N19, 273,600 annually. The average fish processor consumes 16.45kg of fuel wood per day or 7.5m³ of forest wood compared to 0.46m³ estimated for developing countries. The enormous cost of wood, its impact on the forest and the intensive labour involved to smoke fish gives the Kanji Solar Tent Dryer a high economic prospect as the technology requires no fuelwood, little labour and causes no damage to the environment, because it uses solar energy. The Kainji Solar Dryer is a simple and cheap technology that produces dried fish that can compliment smoked and the stockfish that requires millions of dollars of foreign exchange earnings to import.

INTRODUCTION

Kainji Lake basin is a major fish basket of Nigeria contributing over 13.750 metric tonnes of fish in the year 2000 to the Nigeria fish market (KLFPP, 2002). Since fish is easily perishable, there is need for quick and adequate preservation. Some methods of preservation include drying, smoking, freezing, chilling etc. The most popular means of fish preservation around Kainji Lake is by smoking (Eyo, 1992). This could be attributed to the fact that not all fishing communities around the Lake have access to electricity to freeze their fish. Electricity itself is fast becoming a less reliable source of energy for fish preservation.

The large annual fish catches from Kainji Lake require daily processing and preservation using fuelwood which may have led to sharp rise in the

demand for fuel wood. Fish processors around the Lake now source for wood at all cost to meet the growing demand for fish preservation. This has implications for the cost of smoked fish and the forest.

According to FAO (1985), there is a scarcity of fuel wood for drying and smoking fish, which is by far the most widely used method of preservation in the developing countries. The report hinted that the demand for fuel wood, which is the main source of domestic energy for two fifths of the world's population, continues to grow by 1.2 % per year, which is about 90% of the world's fuel wood consumption in the world (0.89m³ per year). An estimated 62.3 million m³ are taken annually from forest and trees resource

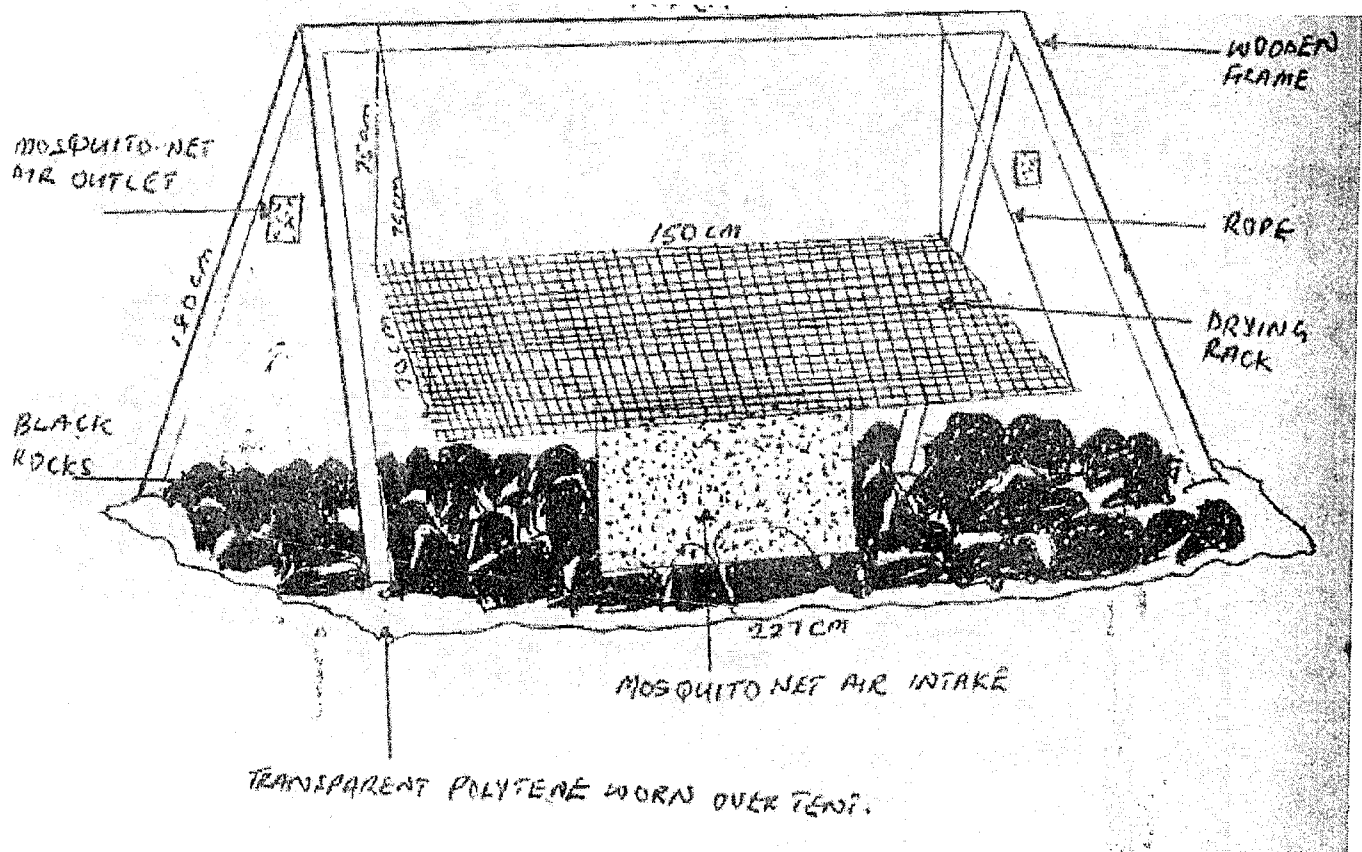


Figure 1 : Kainji solar tent fish dryer

RESULTS AND DISCUSSION

A total number of eleven species were identified and recorded as woods got from the forest around Kainji Lake. Kiria (ironwood), Taura (*Deterium microcarpum*), Dorowa (*Parkia clappertoniana*) and Maje (*Danielli Oliveri*) were preferred best in 60% of the villages because of their good smoke and fast rate of fish drying. This is similar to the findings of Eyo (1985). Least preference was given to Kade (*Butryospermum paradoxium*) and Roba (Heavier *Brazilinsis*) because of their black smoke.

Table 1 shows the projected cost and quantity of wood and fish on a daily, weekly and yearly basis

using 76 fish processors. The results obtained show that the total weight of woods used at the four sites on a daily, weekly and yearly basis are 1,250kg, 7501kg and 3,593kg respectively, going by 6 days of smoking in a week and 317 in a year. The average cost of wood incurred on a daily, weekly and yearly basis is N4,180, N25,080 and N1,325,060 respectively. On a daily, weekly and yearly basis in the sampled sites 599kg, 3,593kg and 189,883kg of fish are smoked respectively. Finally, On a daily, weekly and yearly basis in the sampled sites, N60,800, N364,800 and N19,273,600 worth of fish are smoked respectively.

Table 1: Summary of daily, weekly and annual amount and cost of fuel wood / fish smoked by 76 fish processors

Quantity of wood / person /day	16.45kg
Cost of wood / person / day	₦ 55
Quantity of fish / person /day	7.88kg
Cost of fish / person / day	₦800
Quantity of wood /76 resp./day	1250kg
Cost of wood / day	₦4180
Quantity of fish / day	599kg
Cost of fish / day	₦60,800
Quantity of wood / week	7501kg
Cost of wood / week	₦ 25,080
Quantity of fish / week	3593kg
Cost of fish / week	₦ 364,800.
Quantity of wood / year	396,250kg
Cost of wood / year	₦ 1,325,060
Quantity of fish / year	189,883kg
Cost of fish / year.	₦19,273,600

Calculation from this study show that each fish processor consume 16.45kg per day or 7.5m³ compared to 0.46m³ given as the average by FAO (1985). This depicts the high rate of forest wood consumption per person around the Kainji Lake Basin. This implies very high rate of deforestation arising from high demand of fuel wood for fish smoking.

Several drying trails and field experiences using the Kainji Solar Tent Dryer have shown that fishes between 500gm to 1000gm dry within 15hours spanning 3 days around Kainji Lake and 10 hours spanning 11/2 days in the arid zone of Nigeria. The dryer is capable of drying over 20kg of fresh fish at a go using only solar energy from the sun. The

dried fish loose up to 90% of their water content giving room for a long shelf life. The appearance, smell and taste of the fish are comparable to the imported stockfish. Consumers who have been sampled confirmed this. Stockfish traders at Onitsha are also of the opinion that the product greatly resembled the stockfish. It is hoped that in the long run the product will be able to compete with the imported stockfish, which requires millions of Naira in foreign exchange earnings to be imported. Preliminary studies of the marketing of the solar dried product show that there will be good chances for sales especially in the South East of Nigeria where stockfish is relished.

The Kainji Solar Dryer apart from saving the Kainji Lake Basin' (where the highly cherished Kainji Lake National Park is located) from impending deforestation is thus, also capable of saving fish processors hard earned income spent on fuel wood purchase to the tune of N 1,325,060 used to smoke fish worth N19,273,600 annually. If fish processors around the Lake and other parts of Nigeria adopt this technology, it can enhance the economic power of fish processors. It ca also improve the Nigerian economy by reducing the huge amount of foreign exchange earnings spent on dried fish importation. Figure 2 shows the annual tonnage of dried fish importation by Nigeria between 1995 and 1998. Nigeria imports between 5532 to 12029 tonnes of fish within the period but exported only between 2 and 8 tonnes. If the Kainji solar dried fish is popularized round the country it can save the country the country the huge sums spent on importation as seen in Figure 3.

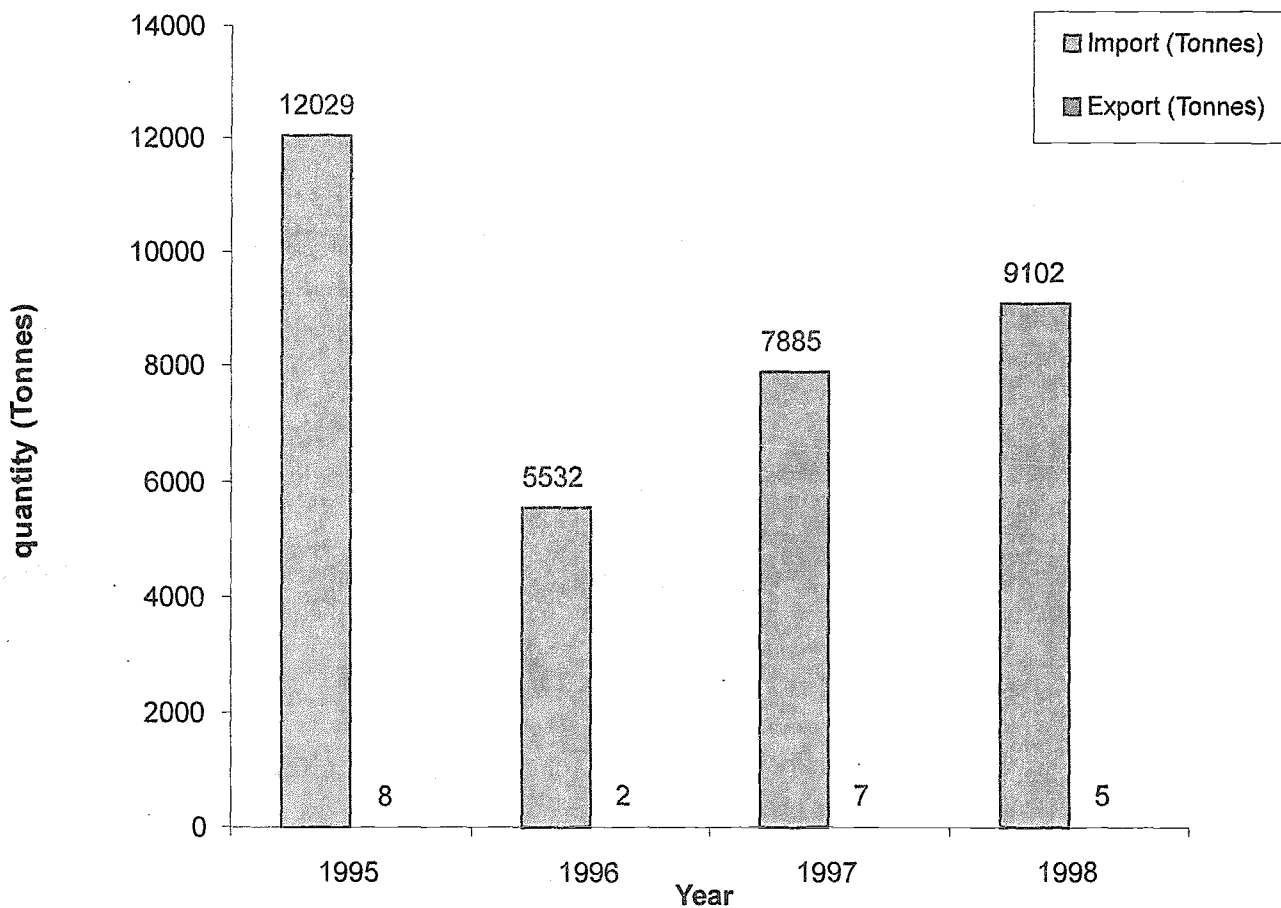


Figure 2: Import and Export of Dried fish by Nigeria between 1995 and 1998.

Source: FAO (2000)

Nigeria spent between \$8,542,000 and \$17,914,000 for the importation of dried fish within this period. This is scarce foreign exchange earnings that could have been saved in there was a local source of the product such as those the Kainji Solar Tent is

SUMMARY AND CONCLUSION

From this study, it can be deduced that much cost was incurred on the purchase of fuel wood annually around Kainji Lake. The species of wood is not of a wide range thus putting those in demand at a risk. If

this situation is not checked, it may lead to a gradual deforestation and bio-diversity loss in the forests around the lake, since all the woods used on day-to-day basis are got from these forests. Previous reports shows that the global forest resource is shrinking either as a result of over harvesting, deforestation and permanent conversion to other form of land use. The causes of deforestation can be attributed to intensive cropping, uncontrolled grazing and high rate of fuel wood resources consumption. This can lead to destruction of forest, which poses a threat to

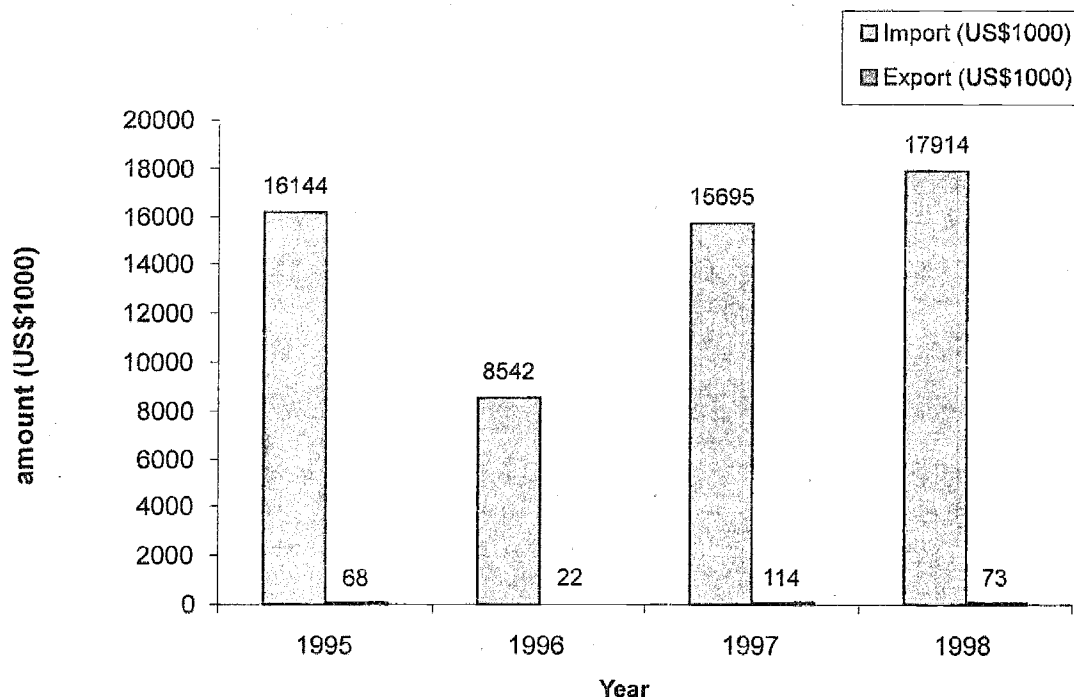


Figure 3: Import and Export of Dried fish by Nigeria between 1995 and 1998.

Source: FAO
(2000)

environmental stability. It will be good if a policy on tree felling is promulgated on the forest around Lake Kainji so as to guide against future occurrence of deforestation. One way to go about this is to encourage local fish processors to adopt and use renewable energy resources in place of fuel wood.

Solar energy is a renewable energy resource that fishermen can harness using the simple solar dryer developed in NIFFR. The pressure on fuel wood can be brought down drastically with this kind of technology. The huge sums of money spent to purchase fuel wood will also be avoided.

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