A FISH DRYER
FOR THE SALT FISH INDUSTRY

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INTRODUCTION

The Sepik River salt fish industry is based on tilapia, *Sarotherodon mossambica*. These fish got into the river in 1959 when some of them were washed out of ponds near Maprik. By 1966 the tilapia had reached their present distribution from the May River to the Marjop Barat near the mouth of the Sepik. They became part of the subsistence fishery and were given the Pidgin name, Makau.

Smoking became a popular method of preserving the tilapia but they still didn't keep for very long and so only nearby markets could be satisfied. In mid-1975 a preservation method using salting, pressing and sun drying was introduced to one of the river villages. By mid-1976 25 villages were producing 6.5 tonnes of salted tilapia per month, which represents a catch of about 20 tonnes. Problems with people not liking the bony salted tilapia were solved in early 1977 by changing over to the production of salted tilapia fillets now called "SOLPIS".

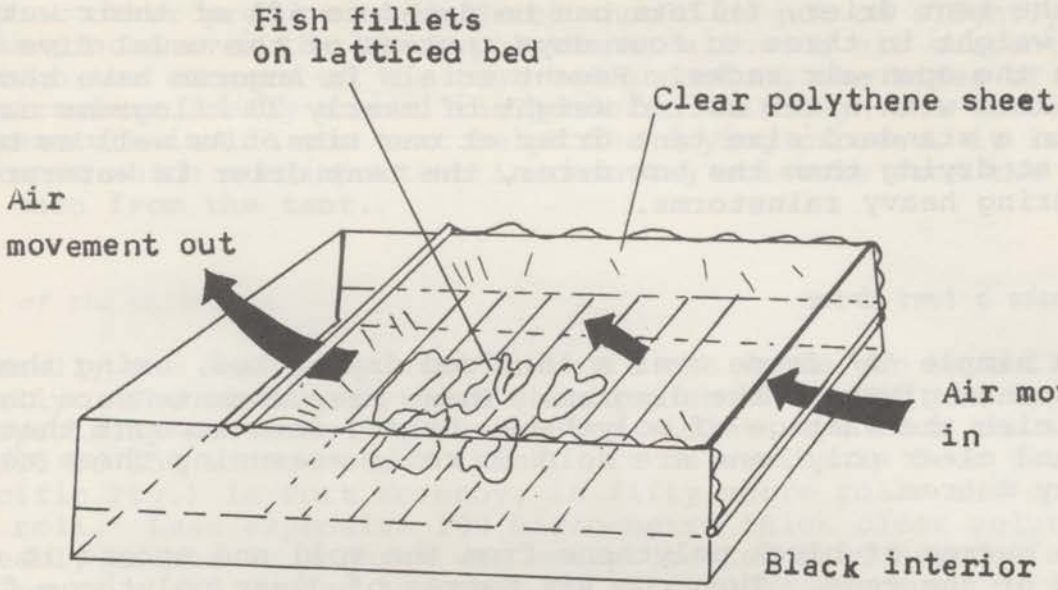
The salted fillets are dried on raised racks made from locally available materials. It takes five to six days of sunny weather to produce the dry fillets. During the wet season, the drying period can be made much longer by cloudy skies and frequent rainstorms which delay the drying. It was therefore decided to carry out research into simple fish driers which could dry fish well in bad weather

THE BOX DRIER

During early 1977, trials on a box shaped fish drier were carried out at Kanudi Fisheries Research Station, Port Moresby, and at the Inland Fisheries Research Station, Angoram, in East Sepik Province.

The box drier was designed by Dr P.E. Doe of the Mechanical Engineering Department, University of Tasmania. Sunlight passes through the clear polythene top onto the black surfaces inside the box. These surfaces are warmed by the sun and heat the air which rises causing an air current inside the box.

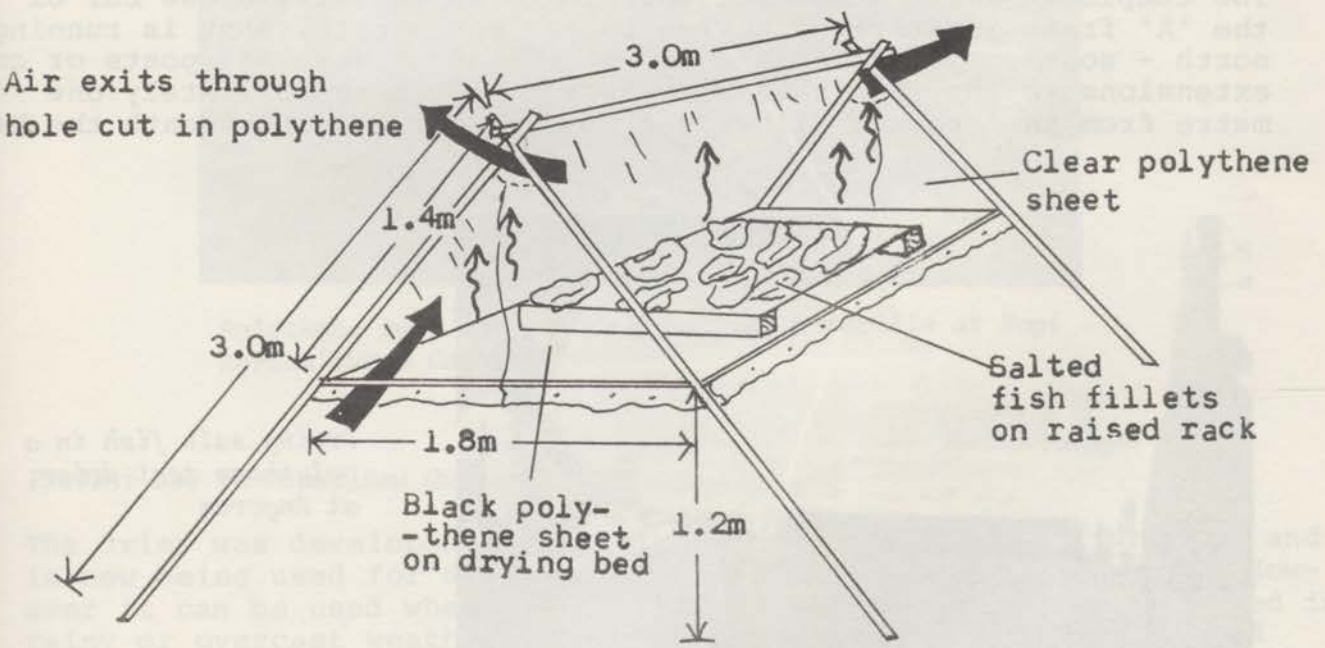
After the trials, the box drier was found to be unsuitable for village production of salted fish because it was not totally rainproof and was only slightly better than simple sun drying. What was needed was a drier design which could overcome these problems.



Box drier

THE POLYTHENE TENT DRIER

This type of drier was successfully tried by Dr Doe and his colleagues in Bangladesh. It works in the same way as the box drier, but lets the heated air leave the drier through rain-shielded holes cut into the polythene at the top corners of the tent. Moisture removed from the fish during drying is either carried out of the tent with this air, or condenses on the inside of the polythene sheeting helping to increase the temperature inside the drier.



Polythene tent drier

Using the tent drier, fillets can be dried to 62% of their wet salted weight in three to four days instead of the usual five to six days on the open-air racks. Recent trials in Angoram have shown that 400 fillets with a wet salted weight of nearly 20 kilograms can be dried in a standard size tent drier at one time. As well as being better at drying than the box drier, the tent drier is waterproof, even during heavy rainstorms.

How to make a tent drier

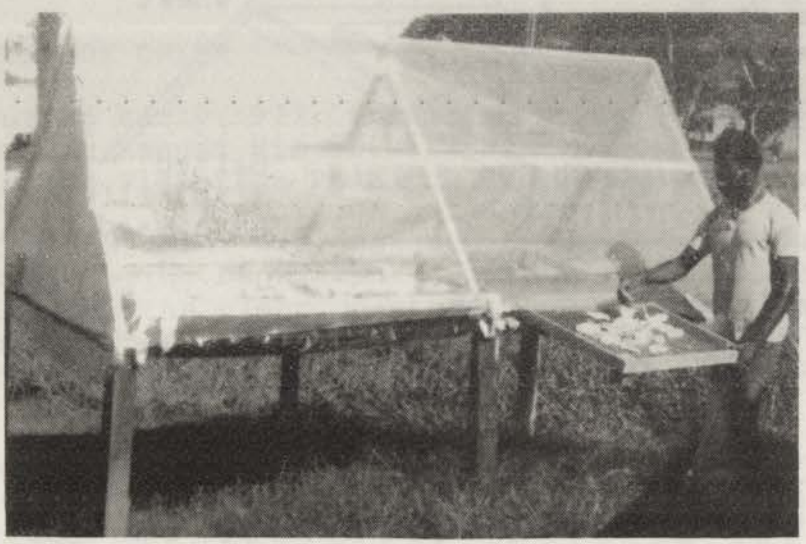
Build a simple 'A' frame over a latticed drying bed, using the measurements given in the diagram. These measurements were chosen to minimise the wastage of polythene, taking into account that both black and clear polythene are sold in rolls measuring three metres by fifty metres.

Cut two metres of black polythene from the roll and spread it over the bed of the tent. Then cut six metres of clear polythene from the roll and hang it over the cross bar of the 'A' frame folding it at the ends, ready for tacking down.
Tack down one side and two ends of the tent to the bed frame through the projecting ends of the black polythene. This is best done with small nails hammered through flat sections of bush cane or bamboo, and should not be so tight as to prevent air from entering the tent. One side should be only lightly attached for ease of entry.

Finally, cut a hole of no more than ten centimetres diameter into the clear polythene at each vertical end of the tent, close to the apex of the 'A' frame. Warm air flowing from these holes shows when the drier is operating correctly.

Positioning and operating the tent drier

The completed drier should be positioned so that the cross-bar of the 'A' frame is at right angles to the sun's path, that is running north - south. The drier should be mounted on vertical posts or on extensions to the 'A' frame so that the bed is approximately one metre from the ground, allowing free movement of air beneath the bed.



Drying salt fish in a polythene tent drier at Angoram

Fish or other produce to be dried should be put on slightly raised racks placed over the black polythene, allowing air currents entering through the corners of the tent bed and along the sides of the tent to circulate freely around the produce. Although the increased temperature inside the tent helps the drying process, it is the air currents which are important in removing moisture from the produce and then from the tent.

Cost of the materials.

Generally the materials used to build the frame can be collected locally. The clear polythene sheeting should be of the type that is specially protected against ultra violet rays from the sun, and should be 150 micro-metres thick. It is available from Tutt Bryant (Pacific Pty.) in Port Moresby, in fifty metre rolls and costs K79.00 per roll. Less expensive 100 micro-metre thick clear polythene used in early trials in Angoram was not protected from harmful ultra violet rays and tended to break up after long exposure to the sun.

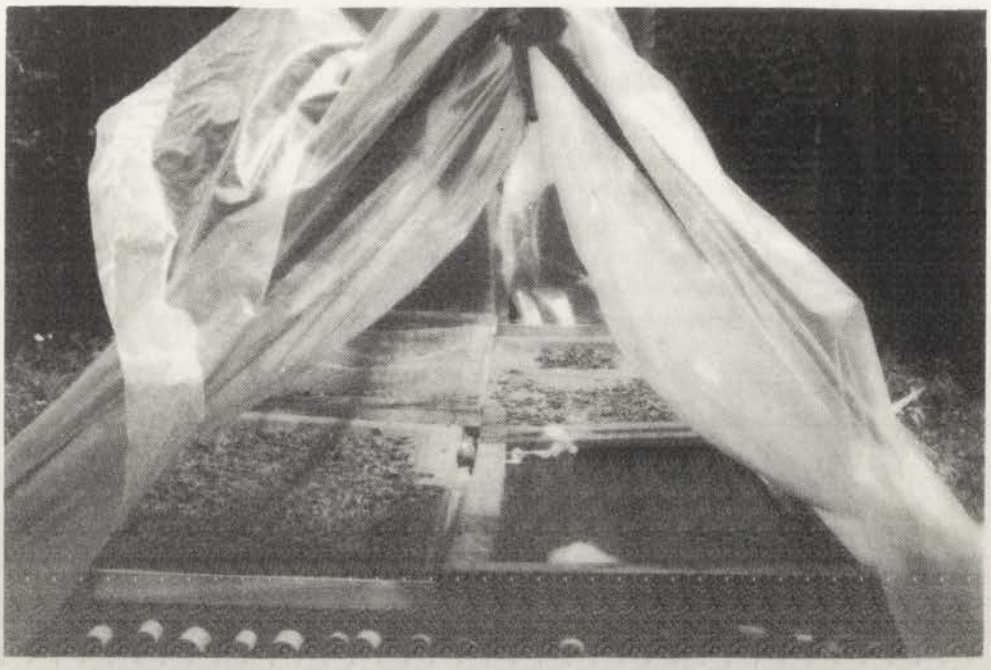
The black polythene sheeting is available from I.C.I. New Guinea Trading Pty. in Lae, and costs K65.00 per roll. Using six metres of the clear and two metres of the black polythene means that the total cost of polythene will be around K12.00 per drier.

Polythene tent drier made from bush materials at Bagi Agricultural Centre

Present use in Papua New Guinea

The drier was developed especially for the Sepik River fishermen and is now being used for drying fish in villages along the Sepik. However it can be used wherever any type of produce needs to be dried in rainy or overcast weather, or needs to be kept away from dust and insects. The Bagi Agricultural Centre near Angoram is using one for drying seeds, roots and sweet potato chips used in the production of potato flour.

To advertise the usefulness of the tent drier, a one-third scale model was displayed at the nation's first Women's Appropriate Technology Workshop in April/May 1978, at the Papuan Agricultural Show in May 1978 and at the Office of Village Development's workshops at Kerema and Kavieng in August and November 1978. It is hoped that through displays such as these the polythene tent drier will be accepted throughout the rural areas of Papua New Guinea.



Interior of the drier at Bagi Agricultural Centre showing the racks