

# Efficient Barns to Cure Tobacco

MALAWI

Project name	Programme for Basic Energy and Conservation (ProBEC)
Project region	Malawi, Zambia, Tanzania
Lead executing agency	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
Duration	01/2005 – 05/2008

## Productive use of thermal energy

Alongside electricity and mechanical energy, thermal energy plays a key role in processing goods and offering services, particularly in remote areas where biomass and solar radiation are often the only source of energy available. Thermal energy – used for cooking, heating, drying and smoking – is an essential input for production processes in agricultural businesses, small industries and commercial services.

## Tobacco production in Malawi

Tobacco is Malawi's largest cash crop. Over 30,000 smallholder farmers own approximately one hectare of land each. Flue cured tobacco is a high quality product. It requires curing for 48 hours at constant low heat and several days of drying to turn the green tobacco leaves that come from the field into the yellow-brown dry leaves sold on the auction floors.

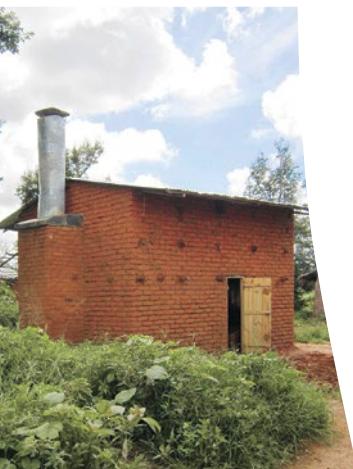
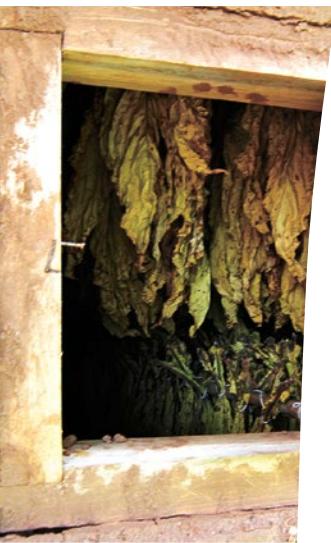




The traditional curing process entails high firewood consumption. Smallholder farmers have to invest 10-20 kg of firewood to obtain 1 kg of cured tobacco.

Farmers can be contracted by tobacco buying companies to grow tobacco according to demand. With the help of extension workers from these companies, the farmers form groups in order to receive advice on good farming practices and to access finance for farm inputs from the banks. Independent farmers sell their tobacco on Malawi's four main government-controlled auction floors.

The tobacco season starts in September. Reaping begins in January; the bottom leaves are hung on sticks before loading them into barns for curing. Depending on the weather conditions and the skills of the operator to control the temperature, curing takes between 5 and 14 days with conventional barns. Once graded, pressed into bales and properly labelled, the tobacco is ready for sale to the tobacco factories, which process the dried leaves and sell them on the international market.



## Technological improvements by the project

GIZ's Programme for Basic Energy and Conservation (ProBEC), together with the tobacco industry in Malawi and consultant Peter Scott, developed the 'rocket barn', an efficient technology for smallholder farmers to cure tobacco. ProBEC also assisted the local non-profit organisation Hestian Rural Innovation Development in the rollout of the technology and the technical training, which help farmers achieve a fuel reduction of 75 per cent. Since then, approximately 1,500 rocket barns have been built and are currently in use.

## The 'rocket barn' pays off!

The 'rocket barn' reduces firewood consumption considerably, from up to 20 kg to as little as 2-3 kg to obtain 1 kg of cured tobacco. The cost of converting an existing traditional barn into a 'rocket barn' is approximately USD 1,300 plus the farmer's contribution of some labour and materials such as bricks and thatch. The barn is built from burnt bricks and has an iron-sheet roof to increase durability.



Two new features contribute to more efficient fuel use: the improved flue pipe transfers the heat more efficiently into the barn. The double chimney induces an effective airflow system, which draws pre-heated air horizontally through the barn, curing and drying the leaves efficiently. This ensures equal heat distribution with improved airflow minimising the risk of barn fires. It also enhances the quality of the tobacco through a controllable curing process. Curing times are shortened, leading to an approximately 10 per cent increase in quantity of sellable product as the tobacco suffers less degeneration. By selling more and at a better price because of improved quality, farmers increase their income. Shorter curing times also require less hired labour to stoke the barns. Maintenance costs for the smallholder farmers are also reduced, as their curing barn is now more durable.

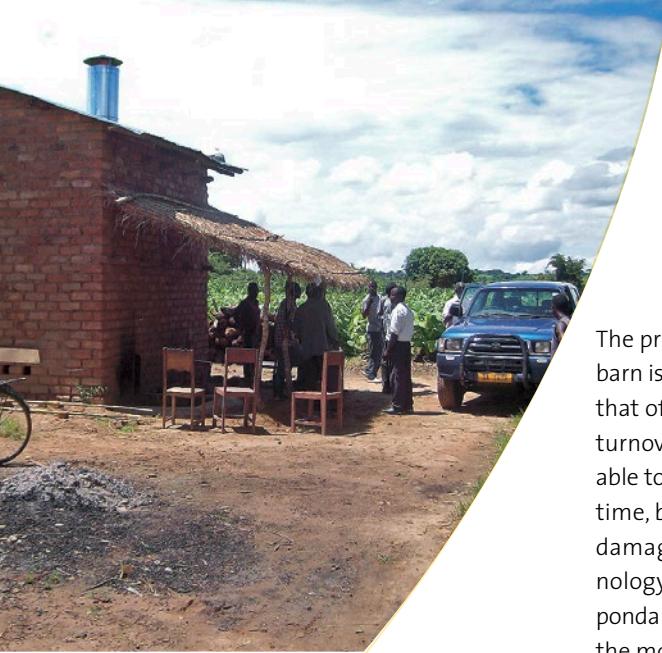
### Using rocket barns successfully

Mr. Kamponda is an enterprising farmer in Kasungu district, in the Central Region of Malawi. He grows 6 hectares of tobacco. That is more than the average smallholder tobacco

farmer. In the conventional barns, Mr. Kamponda used 15 cords of firewood for curing one hectare of tobacco. With the mediocre prices for conventionally cured tobacco he was sometimes paid only USD 8,000 for the entire crop, not even recovering his input costs (e.g. fertiliser) of ca. USD 3,300 per hectare. Life looks much brighter now: since 2009, when he started using rocket barns, he has not made a loss. On the contrary: in 2012, he was paid USD 36,000 for his tobacco, which meant a net profit of USD 16,000 for the season. To date he has more than ten rocket barns which he has already managed to pay off.

With the rocket barns he uses only four cords of firewood to cure the produce of one hectare – a fuel saving of 73 per cent. At a cost of USD 20 per cord, he can save up to USD 1,320 on firewood alone, plus a similar amount of savings on transport of the firewood to the barn.

His yield of dried tobacco per kilogramme of fresh leaf has increased by 10 per cent. In conventional barns the tobacco was often spoiled when it overstayed in the barn, could not be cured at all or was lost in a barn fire.



The price for quality tobacco cured in a rocket barn is up to 30 per cent higher compared to that of conventionally cured tobacco. Since the turnover of tobacco in the barn is faster, he is able to reap the tobacco leaves just at the right time, before the leaves grow too big or are damaged by the weather. Since the new technology requires training for users, Mr. Kamponda has joined forces with Mr. Isaac Salima, the most experienced rocket barn builder in Malawi, and the extension worker of his group Salota to train other farmers.

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