



Kitchen Ventilation **to reduce air pollution levels** **from cookstove smoke**

Some examples from Malawi

Presented by

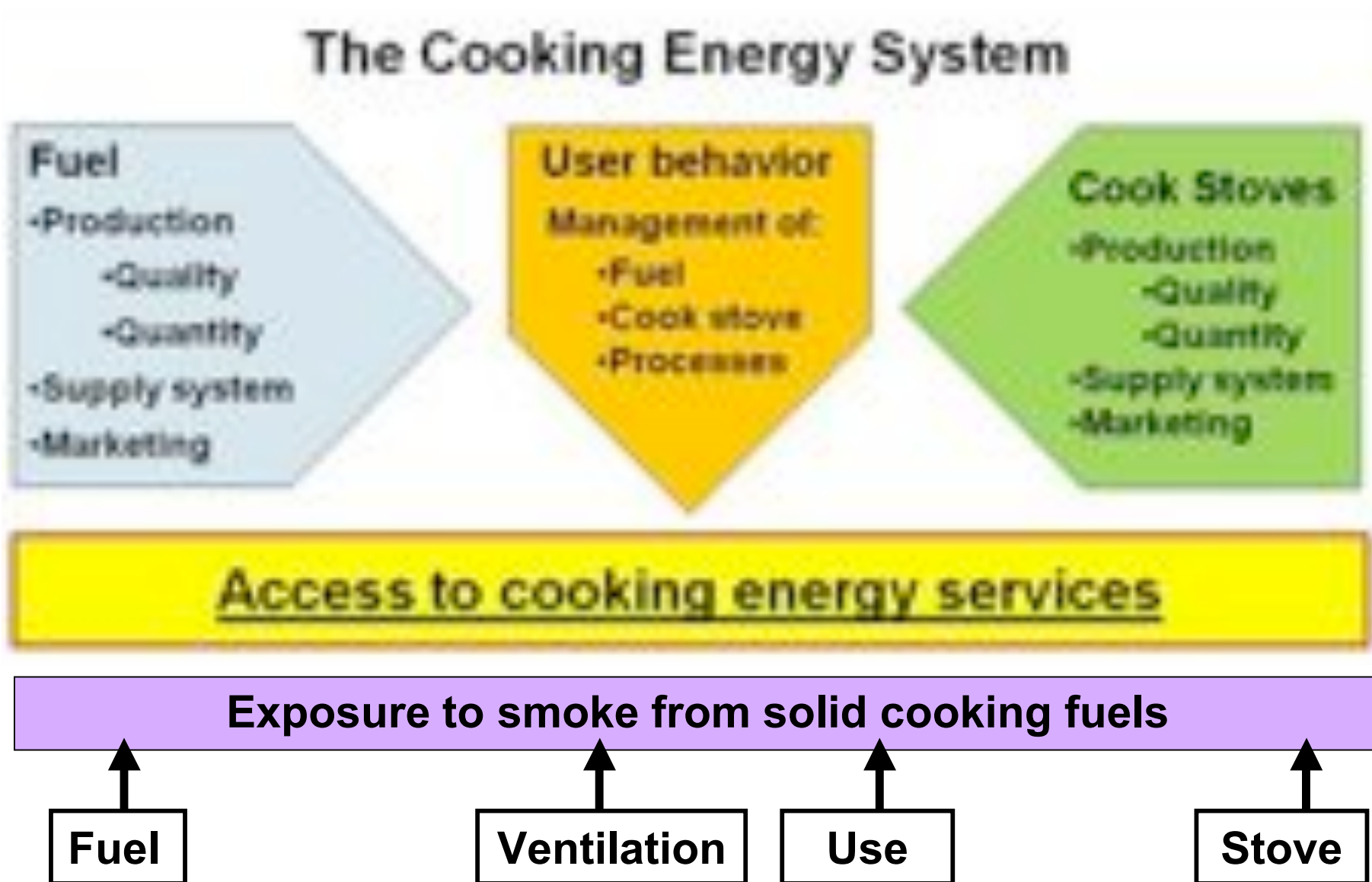
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PCIA-DISCOVER Stove Camp

22nd March, Lilongwe, Malawi



Factors influencing smoke exposure



Baseline: 3-Stones, bad or no ventilation



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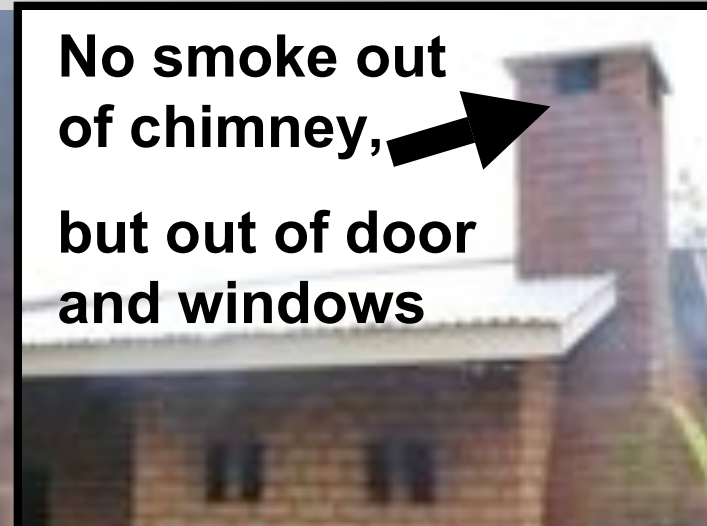


Soot never lies:
the walls and the roof of this kitchen are totally black, indicating that this kitchen used to be filled entirely with smoke. The only ventilation was the door, before opening more ventilation slots.



Lintel was the lowest exit point for smoke: soot-line ca 40 cm below

Baseline: Non-functional chimney



Chimneys a solution for smoke removal?

A chimney is no gurantee for smoke removal. Most chimney-stoves only function well with the pot the stove was designed for, not with a kettle without lip.



Roof shapes and orientation of slope



outlet at highest part of the roof = good smoke removal



no outlet at highest part of the roof = smoke is trapped, black walls

Improving Ventilation of existing kitchens



**New ventilation
slots at highest
points of room**

Improving Ventilation of existing kitchens



Soot pattern on the wall from the old fire up to the roof, because smoke could not get out of the kitchen.

Cross-ventilation: new slots in walls at the height of peoples noses when cooking - cook must see be able to see outside



Observing same kitchen over 4 years

**2007: ventilation slots, new paint.
2011: soot only above the stove,
the wall on the right is still white
= sign of effective
smoke removal**



2007: before and after refurbishment

2011: still same paint

Effective smoke removal without chimney

If climate allows openings in the wall, simple ventilation slots can guide smoke out. Unlike chimneys, they do not need maintenance.



Smoke from freshly lit stove exits through ventilations slots

Effective smoke removal without chimney



2007

2011: there is a bit more soot on the top of the upper opening, but the door lintel is totally white = smoke does not longer exit through the door, but on top and through the ventilation



Integrated features for improved kitchen practices

**inbuilt fireless
cooker**



**sandbox to extinguish
firewood after cooking**



**inbuilt stove (complemented
by portable stove)**

**storage for firewood
next to stove**

Ventilation features of a simple kitchen

Monopitch roof to guide smoke out, with thatch or ironsheet

open eaves-
spaces
at height of
head of
people
standing



nose
level

wide entrance,
no door

Cross-ventilation: slots in walls at the height of peoples noses when cooking - cook must see be able to see outside

Reducing smoke with dry fuel

Even the 'cleanest' stove will smoke when used with wet wood.

'Clean' cooking is not a result from the stove, but from how you use it!

Drying rack for firewood under shelter