63.

Bamboo: Stop The Killer In The Kitchen

Kilakala Secondary School

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Abstract:

This project aims at proving the efficiency of the non-smoke bamboo stove, made of clay and bamboo chimneys, in healthy cooking using less firewood as compared to the local three stones stove. It especially aims at improving the health of local cooks at home and the local food sellers in our society by preventing direct exposure to smoke while cooking. Hence reduce indoor air pollution that leads to acute respiratory diseases and infections.

Especially for developing countries(Tanzania as a study case)

Especially for the poor.

Especially for the women and children.

The bamboo stove can easily be designed hence any society member can practically design it, using the local available materials.

Method:

Bamboo shoots and clay soil have numerous potentials. However the effectiveness of bamboo shoots as chimney is still not known. Hence the project tend to show the effectiveness of bamboo shoots as chimney and clay as cooking stoves.

This project constructions were mainly done in the school laboratories and the testing was done from the school food sellers

Photos and pictures were taken at different places around Morogoro municipal such as in Kilakala secondary school and Mkundi areas showing Smokey three stone stoves.

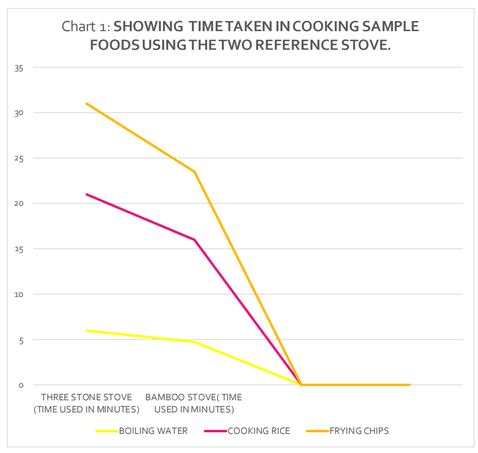
The visiting of sites involved surveying the targeted areas which are, Mkundi area and Kilakala secondary school, educating the local cooks and food sellers on the disadvantages of using Smokey three stone stoves and advantages of using clean non smoke bamboo stove.

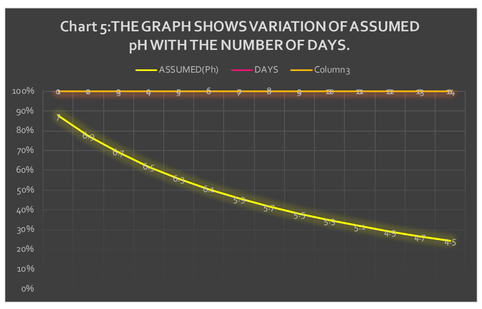
Results:

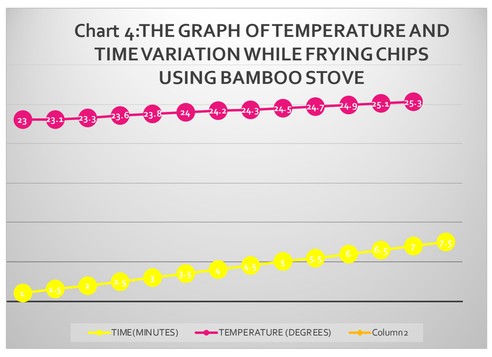
The graph shows how time decreases when the bamboo stove is used as compared to the local three stone stove.

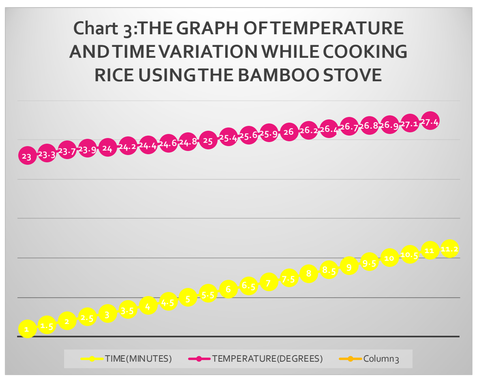
The effectiveness of the bamboo shoot as a stove chimney is due to the absence of secondary growth wood causing the stem of the bamboo to be columnar rather than tapering hence provide an absorbing chimney. Also the external and internal diameter causing radial heat flow throughout the bamboo hence provides an absorbing chimney. The radial heat flow is pure science from the concept of heat. Calculations of the radial heat flow can be made to show how heat is poorly transferred throughout the bamboo shoot.

Cooked sample foods(small saucepan)	Three Stone Stove (Time used in minutes)	Bamboo Stove (Time used in minutes)
Boiling water	6	4.8
Cooking rice	15	11.2
Frying chips	10	7.5









Conclusions:

The findings showed that the physical and chemical changes of clay upon firing turns it into a ceramic material thus it can be used as a stove. The absence of secondary growth wood causes the stems of bamboo to be columnar rather than tapering hence provides an absorbing chimney, also **the low value of thermal conductivity** of the bamboo shoot increases its efficiency as a chimney, having an external and internal diameter that **causes radial heat flow that decreases as the length of the chimney increases**

References:

Biology Prentice Hall by Miller Levine

Advanced level physics by Noakes

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