Available online at http://www.journalcra.com

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

International Journal of Current Research
Vol. 13, Issue, 03, pp.16588-16591, March, 2021

ISSN: 0975-833X

DOI: https://doi.org/10.24941/ijcr.40967.03.2021

RESEARCH ARTICLE **OPEN ACCESS**

THE COMPARATIVE EFFICIENCY BETWEEN CONVENTIONAL TRADITIONAL STOVE AND MODERN MODIFIED ROCKET STOVE IN LADAKH- ANALYSIS OF TIME SAVING, ENERGY SAVING AND TEMPERATURE VARIATION ON DIFFERENT CHAMBER

***Tsewang Norboo**

Lovely Professional University Phagwara, Punjab, India

ARTICLE INFO

Article History:
Received 18th December, 2020
Received in revised form
07th January, 2021
Accepted 15th February, 2021
Published online 26th March, 2021

Key Words:
Time Saving, Energy Saving, Purpose serve, Heat Lasting, Ladakh.

ABSTRACT

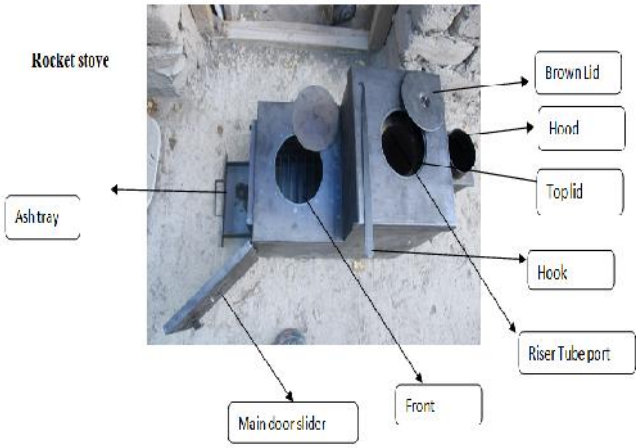
Ladakh a cold arid desert lie in the lap of trans Himalaya where temperature drop down more the minus 30°c in pick winter and in summer temperature scale up more than plus 30°c. such area is mainly accompany with cold climate where heat stove is the major essential commodity for inhabitant. Since existence of livelihood stove is the closed and major essential commodities of area. Cow dung and locally produce woods are the major source of fuel, with the passage of time and technology new modified and fuel efficient stoveswere developed one of which is Himalayan rocket stove which become highly popular and effective from last two to three year. This study examined comparative time saving, energy saving efficiency, purpose serve and heat lasting between traditional and modern modified rocket stove. The analyzed result reviled that in term of time saving traditional stove is better than modern stove (time taken by modern rocket stove to boil 2 lit of milk = 25 minute whereas traditional stove took 15 minute), Energy saving / fuel consumption is concern modern rocket stove is better than traditional stove (1050 gm of cow dung and 150 gm of wood consume to boil 2 lit of milk whereas rocket stove consume hardly 700gm of cow dung and 100 gm wood. In the case of heat lasting modern modified rocket stove is far batter then traditional stove may be better utilization of material, but multi-purpose serve is concern traditional stove serve much purpose then rocket stove. The study finding both the stove have their own limitation and advantage but can be improved by doing few modifications for better utilization.

Citation: Tsewang Norboo. **2021**"The comparative efficiency between conventional traditional stove and Modern modified rocket stove in Ladakh- Analysis of time saving, energy saving and temperature variation on different chamber.". *International Journal of Current Research, 13, (03), 16588-16591.*

INTRODUCTION

The goal of the comparative testing of two stove is to determine the efficiency of modified stove in respect to time, fuel, purpose serving, duration of heat lasting, Ashes arise and fuel cost. Stove is indivisible part of human life especially for those inhabitants of cold harsh climate like Ladakh. But considering the negative externalities like pollution, fuel saving, duration of heat lasting etc. it become important to bring change in the existing structure and can be use more efficiently. Following are some specification of Modern modified rocket stove and traditional stove.

Corresponding author:** ***Tsewang Norboo,
Lovely Professional University Phagwara, Punjab, India.



Traditional stove

Time saving calculation: For time saving (TS) 2 lit. of milk placed on the front lid of both traditional stove and modern rocket stove.

TS=TCM-TCT

Where

TS = Time saving.
TCT= Time spent cooking with traditional stove.
TCM= Time spent cooking with Modern rocket stove.
TCT= Traditional stove took 15 minutes to boil 2 lit of Milk on front lid.
TCM=Modern rocket stove took 25 minutes to boil 2 lit of Milk on front lid.

Therefore

TS=TCM-TCT

TS=25 Minuts-15 Minute
TS=10 Minutes or 40%
Thus, in case of time saving Traditional stove is better than modern modified rocket stove it almost saves 10 minutes to boil 2 lit of milk.

Fuel saving: For fuel saving/ Energy saving (FS) 2 lit. of milk placed on the front lid of both traditional stove and modern rocket stove.

FS=FCT-FCM

Where

FS = Fuel saving.
FCT= Fuel consumed by Traditional stove.
FCM= Fuel consumed by modern stove.

FCT= Traditional stove consume 1050 gm of cow dung and 150 gm of wood, on an aggregate 1200 gm of fuel (1050 gm cow dung + 150 gm of wood) used.

FCM= Modern rocket stove consume 700 gm of cow dung and 100 gm of wood, on an aggregate 800 gm of fuel (700 gm of cow dung and 100 gm of wood) used.
Therefore

FS=FCT-FCM

FS=1200 gm fuel - 800 gm fuel

FS=400 gm or 33.33%

Thus, in case of fuel saving modern modified stove is better than traditional stove, on an average 400gm or33.33% fuel save by using modern rocket stove.

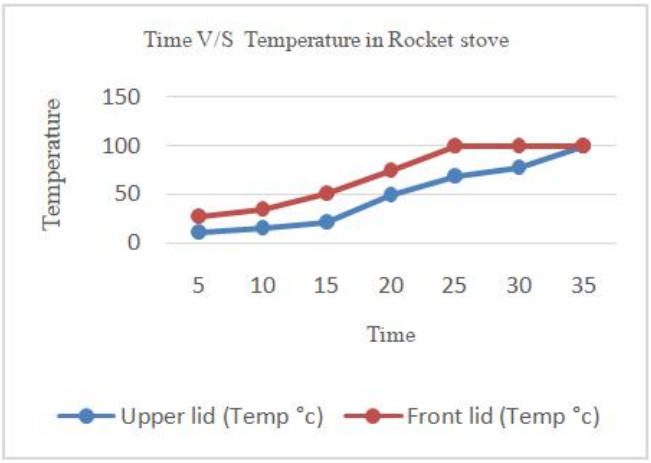
Heat duration Lasting: As far as the duration of heat lasting is concern modern rocket stove is much better than the conventional traditional stove, there may be various reason. The First and fore most reason is use of thick and better quality of material and second reason may be modern modified structure like inbuild Riser tube port which retain heat for longer time, Hood liver rod which control emission of hot realized carbon, main door slider which allow oxygen for fuel burning. In recent analyzed testing for heat duration lasting modern rocket stove show better performance than traditional stove. Modern stove retain heat almost for two hours whereas traditional stove retain heat for one hour only.

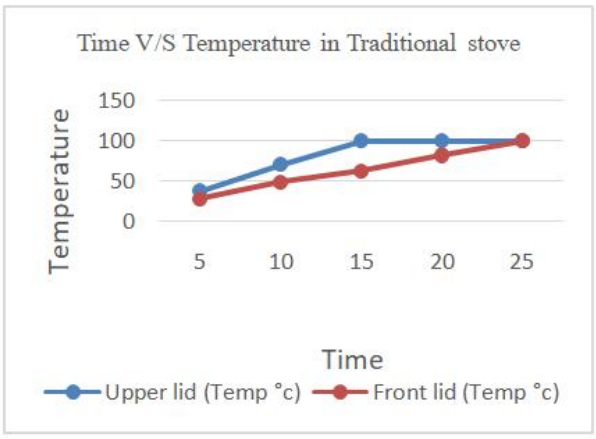
Purpose serving: In the case of purpose serving traditional stove show better performance than modified modern rocket stove. Modern stove serves only two purpose first heating and second limited cooking whereas traditional stove is concern it serve several purposes like cooking, heating, tradition bread baking, keep food and water warm.

Traditional stove **Rocket stove**

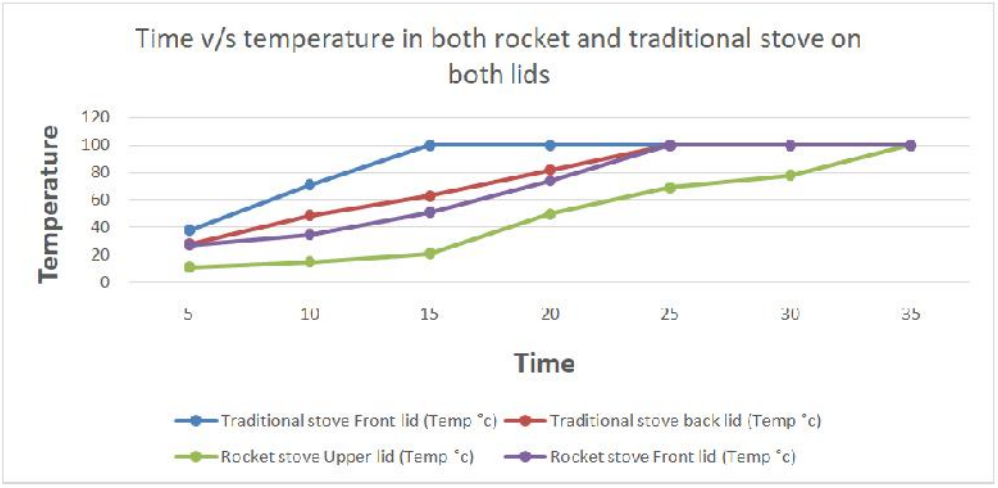
Quantity of ashes arise

In the case of ashes, traditional stove performs far better than the modern rocket stove. In the case of modern rocket stove ash holding size tray is small as compare to traditional stove ashes tray. On an average every two hours users have to clear ashes tray which is inconveniences for them. Whereas in the case of traditional stove size of ashes tray is much larger than rocket stove so its convenience for the users on an average user must clear ashes tray on alternative day which is both conveniences and feasible for users.





Graph (1).



Whole analysis is done to boil 2 lit of milk on both lids

S.nos	Particular	Rocket stove	Traditional stove
1	Time taken	25 minutes	15 minutes
2	Fuel consumption	800 gm	1200 gm
3	Duration of heat lasting	2 hrs	1 Hrs
4	Purpose serving	Cooking and Heating	Cooking, heating, local bread baking, to keep water and food warm
5	Qty. of ashes arise	One half ash tray filled in 2 hrson use of 800 gm fuel (cow dung and wood)	¼ ash tray filled in 1 hrson use of 1200 gm fuel (cow dung and wood)
6	Fuel cost	Incurred Rs 0.84 to boil 1 lit of milk	Incurred Rs 1.44 to boiled 1 lit of milk

Input cost

As far as input cost is concern modern rocket stove is more economically then the traditional stove since rocket stove consumed less fuel than the traditional stove. On an average Rs 0.84 incurred to boiled 1 lit of milk whereas in the case of traditional stove which consumed higher fuel then rocket stove. On an average Rs 1.44incurred to boiled 1 lit of milk.

Instrument used

TP 101 Thermometer temperature test pen is used to measure the milk temperature with respect to time span.

Time and Temperature compression between two stoves: The following graph (1) depict the time and temperature compression of rocket stove. In the recent trial 2 lit of milk placed on both lids of rocket stove using 700 gm of cow dung and 100 gm of wood whereas front lid is more efficient than upper lid, in order to boiled 2 lit of milk front lid took 25 minutes and upper lid took 35 minutes to boiled 2 lit of milk. Like wise graph (2) explain the time and temperature compression of traditional stove, here too primary lid is more efficient then secondary lid, in order to boiled 2 lit of milk on primary lid took 15 minutes and secondary lid took 35 minutes to boiled 2 lit of milk.

The following graph (3) explain the time and temperature in both rocket and traditional stove on all the four lids, out of all the four lids traditional stove front lids is most effective, 2 lit of milk boiled just in 15 minutes followed by traditional stove back lid and rocket stove front took 25 minute and rocket stove upper lid took 35 minutes.

Tabular representation of whole analysis: Whole analysis is done to boil 2 lit of milk on both lids

REFERENCES

Chagunda, M.F., Kamunda, C., Mikeka, J.M.C. & Palamuleni, L. 2017. Performance assessment of an improved cook stove (Esperanza) in a typical domestic setting: implications for energy saving. *Energy, Sustainability and Society*, DOI 10.1186/s13705-017-0124-1.

Kshirsagar, M.P. 2019. Experimental study for improving energy effency of charcoal stove. *Journal of scientific & Industerial Research*, Vol. 68: 412-416.

Manoa, D.O., Oloo, T. &Kasaine, S. 2017. The Efficiency of the Energy Saving Stoves in Amboseli Ecosystem-Analysis of Time, Energy and Carbon Emissions Savings. *Open Journal of Energy Efficiency*, Vol. 6: 87-96.

****