

# **THE ROLE OF IMPROVED BIOMASS STOVES IN CONSERVING ENERGY**

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# **Outline:**

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1. Introduction
  2. Government Interventions to Alleviate the Energy Crises
  3. Technical Aspects of Improved Biomass Stoves Being Disseminated
  4. Commercialization, Sales and Price of Stoves
  5. Impact of Interventions
  6. Conclusions & Recommendations
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# 1. INTRODUCTION

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- ✍ Abundant Renewable energy Resources –but the overall energy profile is characterised by heavy dependence on biomass.
- ✍ Per capita consumption:
  - 1997.....263 Kgoe
  - 1998.....268 Kgoe
  - 1999.....279 Kgoe

This indicates that the energy sector of Ethiopia is among the least developed in the world

# INTRODUCTION(...Continued)

- ✍ Fuel wood requirement/y.h=560Kg
- ✍ Deforestation rate/y=0.43%.....~ The resource is depleting fast as result of several constrictants, among these
  - a) The use of a three stone open fire= Inefficient device
  - b) Fast population growth

## **2. GOVERNMENT INTERVENTION**

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### **Mitigation Measures Devised:**

**Demand management strategies introduced/implemented, which include large-scale dissemination of:**

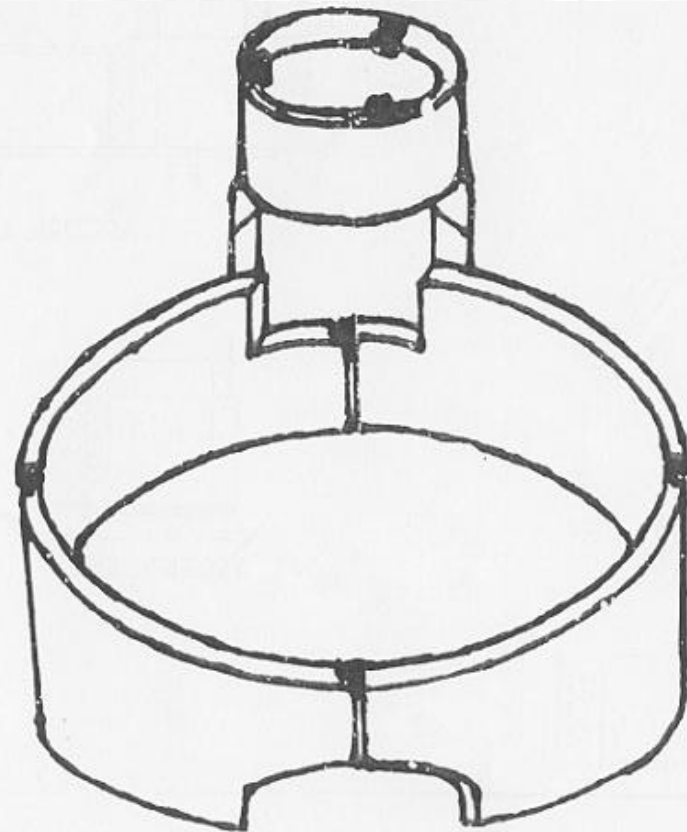
- a) Fuel wood stove**
- b) Charcoal stove**

# 3. TECHNICAL ASPECTS OF THE IMPROVED STOVES (Cont..)

## 1. Mirt Enclosed Injera Stove

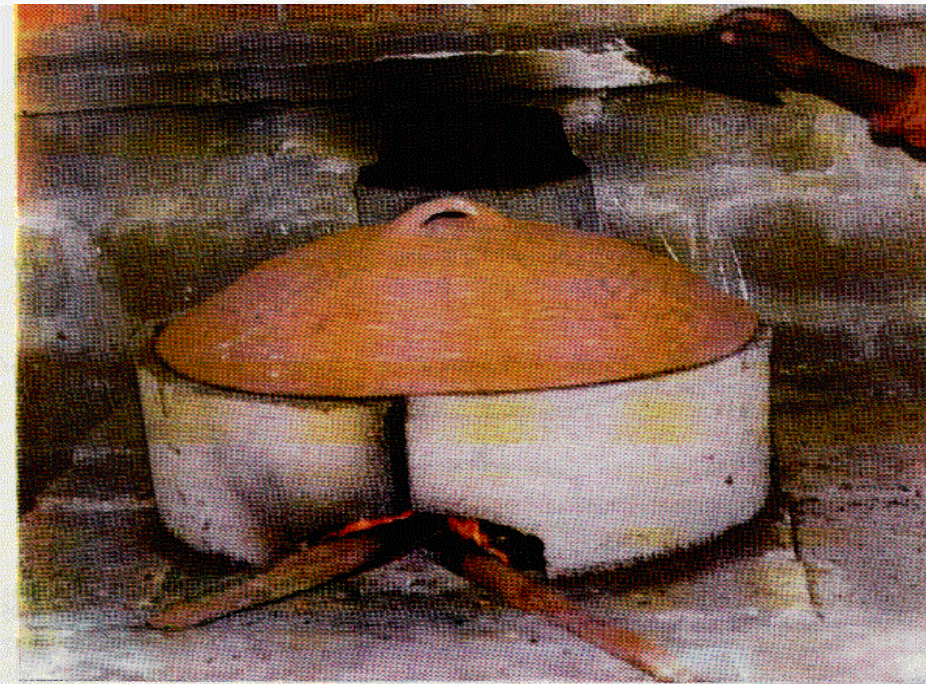
### a) Design

- ✍ Designed by the EREDPC, formerly EESRC, Financial support WB
- € Basic design adopted from the Ambo & Burayu enclosed injera stoves.....
- ✍ Further Optimized to handle different types of biomass fuels



## Figure 1 – Mirt enclosed biomass stove

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# TECHNICAL ASPECTS OF THE IMPROVED STOVES (Cont...)

## b) Raw materials and Production

\* Cement

\* Pumice (volcanic ash)..=binds well with cement + Good Insulator

## c) Stove Performance

The efficiency of Mirt ranges : 19% - 21%

While, the traditional about : 10.6%

Comparative Fuel saving : 45% - 59%

When properly utilized it serves about 8 years.



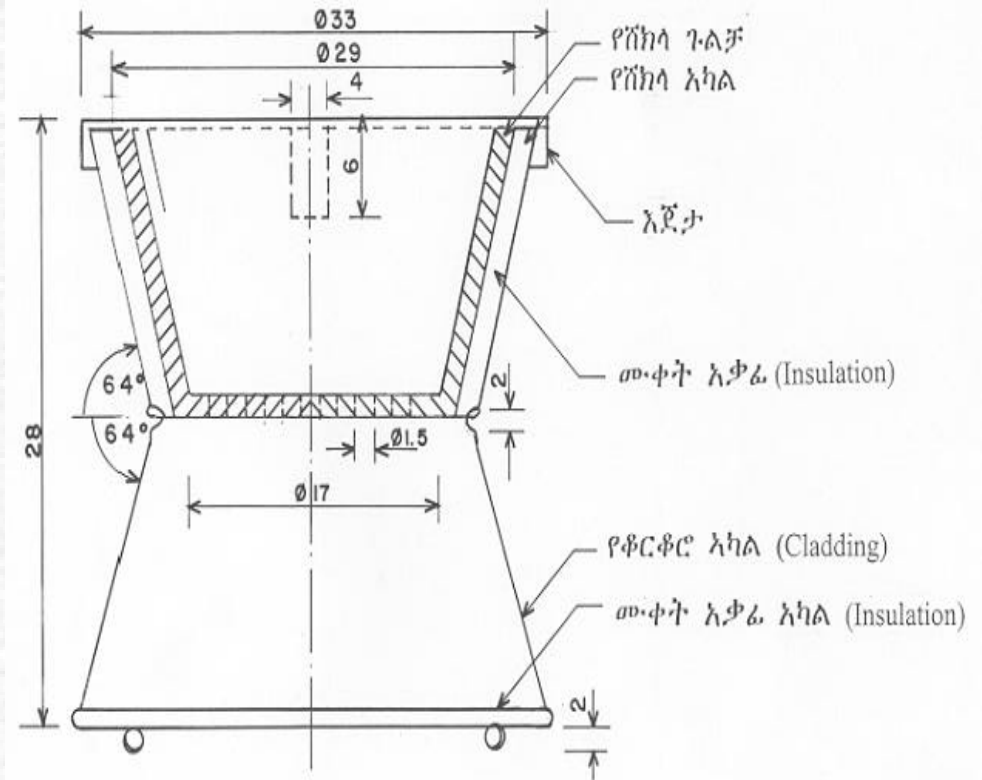
# TECHNICAL ASPECTS OF THE IMPROVED STOVES (Cont...)

## 2. Lakech Charcoal Stove

### a) Design

- € adopted from the Bako stove
- ✍ Modifications made by the EREDPC, formerly EESRC, in order to improve the efficiency, Financial support WB

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# TECHNICAL ASPECTS OF THE IMPROVED STOVES (Cont...)

## b) Raw Materials

Lakech Stove= Clay + Sand +Cement +Sheet Metals for Cladding

Production of the stove requires a skill in:

- \*Metal Artisan

- \*Potter

Tools used to produce:

- \*Tin snips, hammer, anvil (for the cladding), paddle mould, perforated template and puncher.

# TECHNICAL ASPECTS OF THE IMPROVED STOVES (Cont...)

## c) Performance

- \* The stoves 25% Charcoal over the the best traditional charcoal stove.

OR

It saves 125 gm of charcoal per day per hh.

## 4. Commercialization, Sales and Price of Stoves

### 1 Mirt Injera Stove

#### a) Commercialization

- The whole process of designing and dissemination of Mirt Stove followed six steps
- Large-scale dissemination was made supported by Media advertisement & cooking demonstration
- Providing intensive training for the private sector.

#### b) Sales

- Since 1995, dissemination started, until now over 400, 000 stoves are disseminated all over the country

#### c) Price

- Addis Ababa Whole Sale USD 2.94
- Retail Price USD 4.12
- Price can go up to USD 5.29 when transport service is provided customers)

# Commercialization, Sales and Price Stoves (Cont..)

## 2. Lakech Charcoal Stove

### a) Commercialization

- Similar Commercialization strategy as Mirt stove.
- Sales outlets are open markets, shops and super markets.
- Quality control is conducted by sales monitoring.

### b) Sales

- By now the total Sales of the Stove exceeds 1.5 million.

### c) Price

- Initial retail price during earlier dissemination was USD 3.53 and 4.12 for the medium and large sizes respectively.
- Currently price drooped down to USD 0.88 and 0.65 for the large and medium size stoves respectively. (Oil cans, scrap metals)
- With proper material the price can go up to USD 2.35 and 2.94 for the medium and large stoves respectively.

# Impact of Interventions

As a result of the intervention, to date it is believed that due to the dissemination of:

## Mirt Stove & Lakech

- ✍ About 475.44 Kt of wood is saved per annum
- ✍ 122, 619 ha of forest area maintained from depletion
- ✍ About USD 47 million is saved per annum
- ✍ Employment opportunity is created
- ✍ Reduction of indoor air pollution, improved health conditions and kitchen hygiene
- ✍ Mitigation of greenhouse gas emissions

# Conclusions, Recommendations

- ✍ Despite abundant renewable energy resources the energy sector of Ethiopia is heavily, dependent on biomass (95% of national energy supply).
- ✍ The household sector is the predominant consumer of Gross National Energy Supply.
- ✍ Employing a three stone open fire coupled with the fast population growth aggravated the energy crises
- ✍ To alleviate the problem, demand management strategy has been devised and being implemented. AS a result encouraging records obtained.
- ✍ Hence, it is recommended that the dissemination of the improved stoves should concentrate in rural areas where, inefficient cooking Practices are employed.





**THANK YOU!**

