

# International workshop on 'Sustainable Rural Bioenergy Solutions in Africa'

19<sup>th</sup> Jan 2018

## Project Klimablick

Unlocking Potential of New Cooking Methods with Bio-Briquettes  
and Efficiency Stoves for Rural Areas in Madagascar



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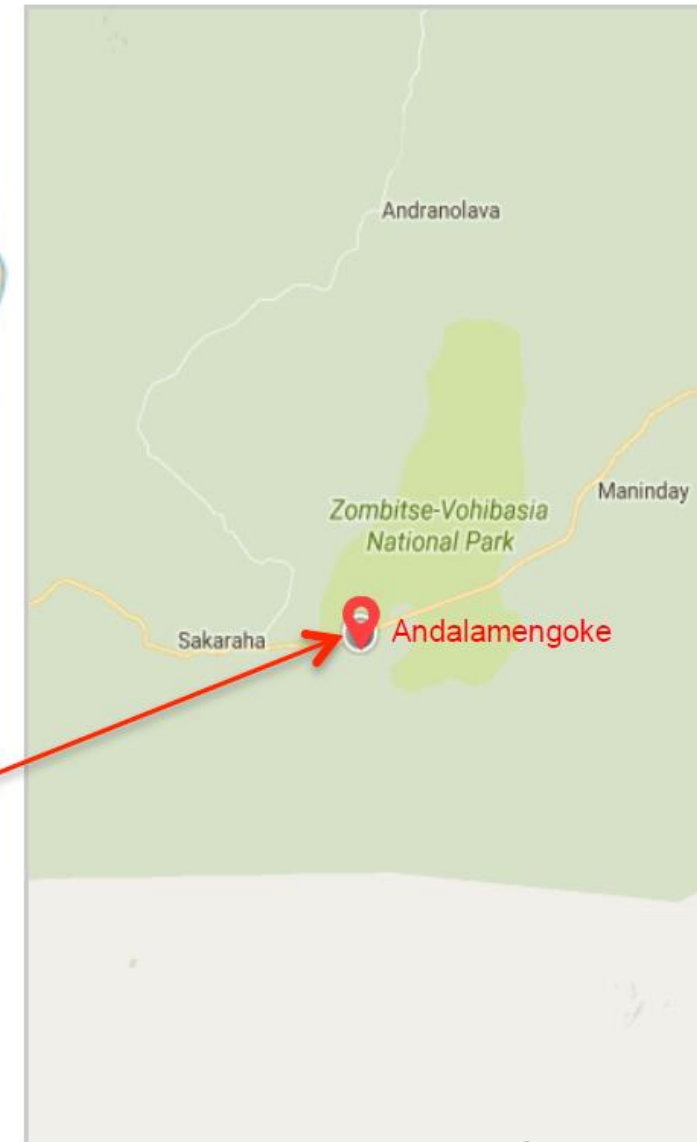
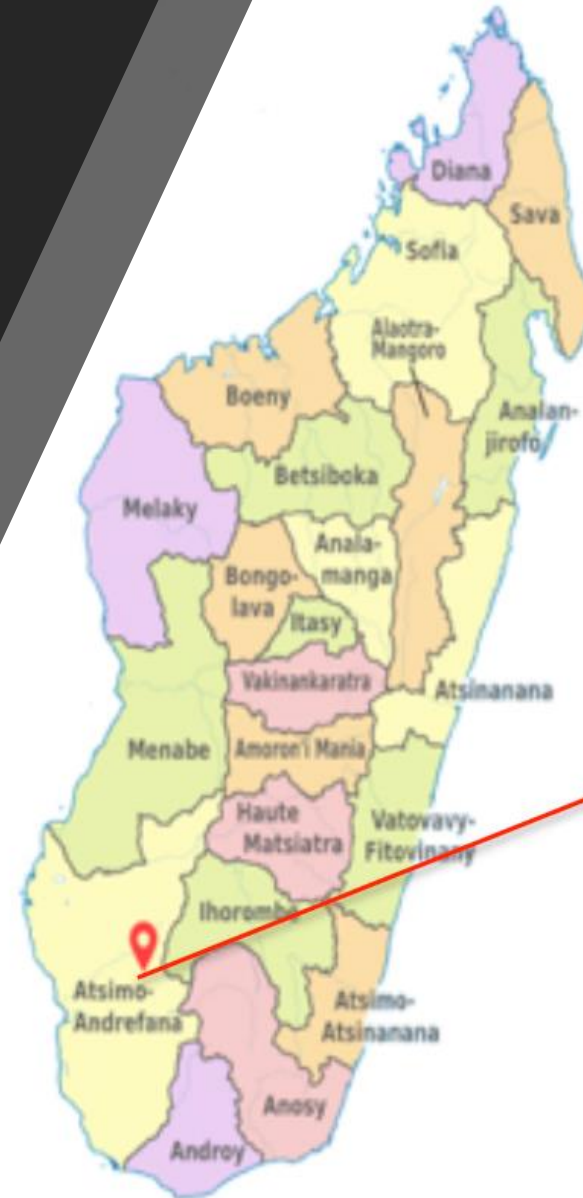
**Project Coordinator  
Lernen-Helfen-Leben e.V.**

# Outline

- Introduction and Problem Statements
- Organization Involved
- Efficiency Stoves
- Biomass Hand-Press
- Results from Experiments
- Energy Production Calculation
- Conclusion and Future Scopes
- References

# Introduction

- Madagascar is the 4<sup>th</sup> largest island and with rich vegetation, it is a biodiversity hotspot
- Uncontrolled logging, forest fire, traditional practices have depleted the forest cover threatening biodiversity, water resources and soil stability
- Additionally, it is one of the ten countries expected to be the most affected by climate change in the world



## Organizations Involved

### **Lernen-Helfen-Leben e.V., Germany**

Founded by retirees in Germany and its objective are to establish and support projects in developing countries

### **AJPER, Madagascar**

AJPER is the partner organization of LHL working and promoting the projects in Madagascar

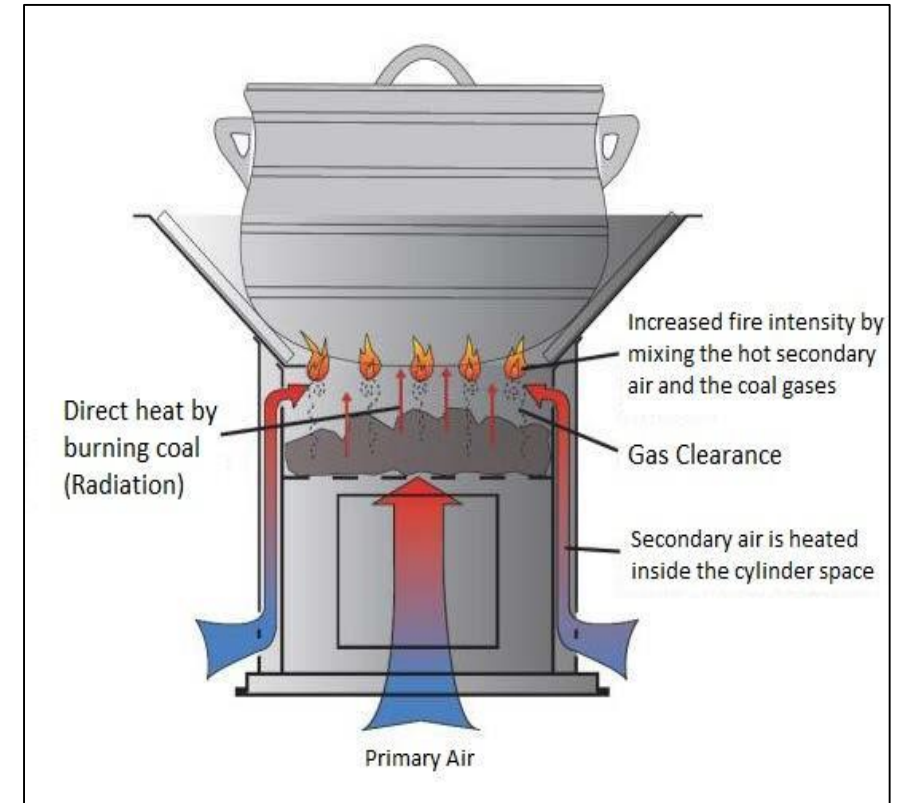
# Efficiency Stoves



**Model 1: Wood Stove**



**Model 2: Charcoal Stove**



**Model 3: Pyrolysis Based Stove**



# Biomass Hand-Press for Briquettes Production

- Simple manual mechanism
- Easy assembling and dismantling
- Easy transfer



Source: Own





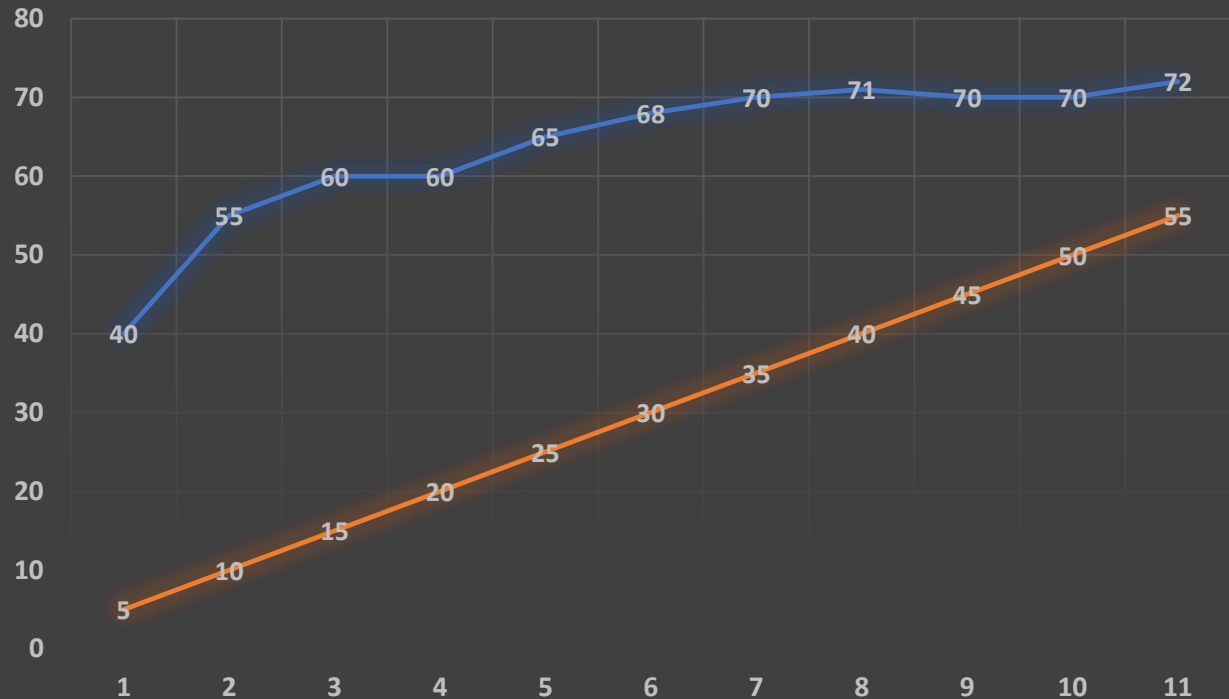
# Briquettes Manufactured

# Experiments and Results

## Comparison between Stoves

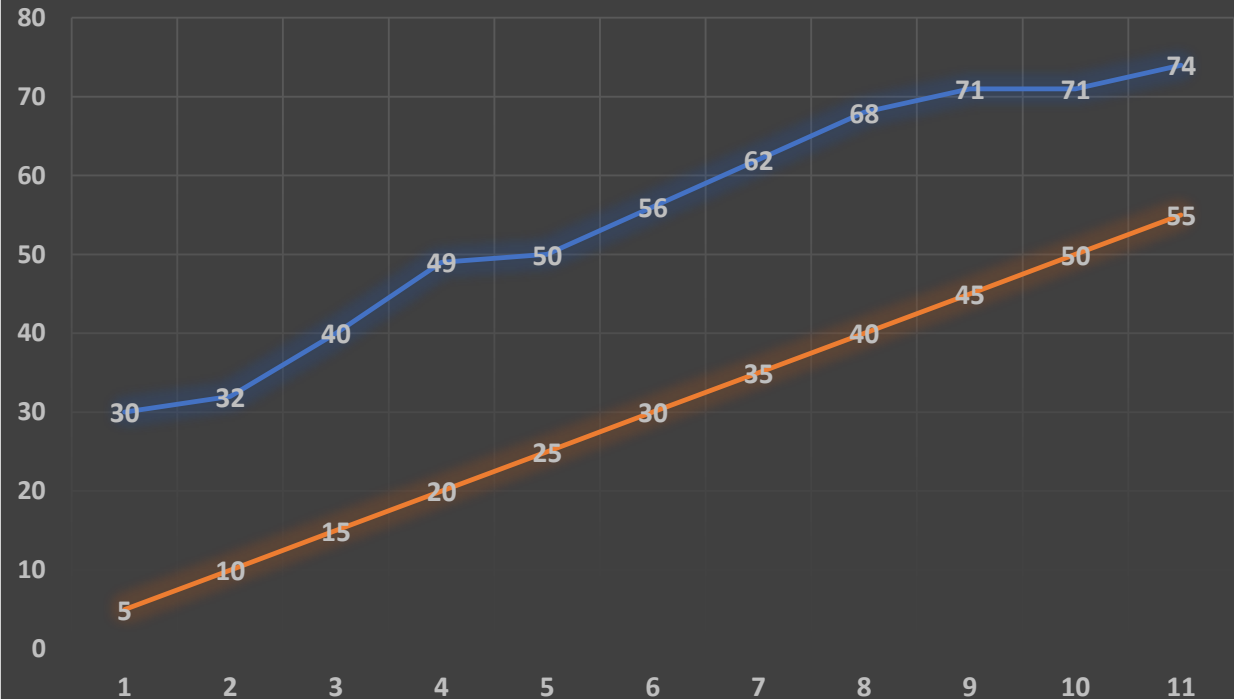
### German Stove

— Temperature of water (°C) — Time Interval (Minutes)  
X-Axis: Number of Intervals  
Y-Axis: Values Obtained



### AJPER Stove

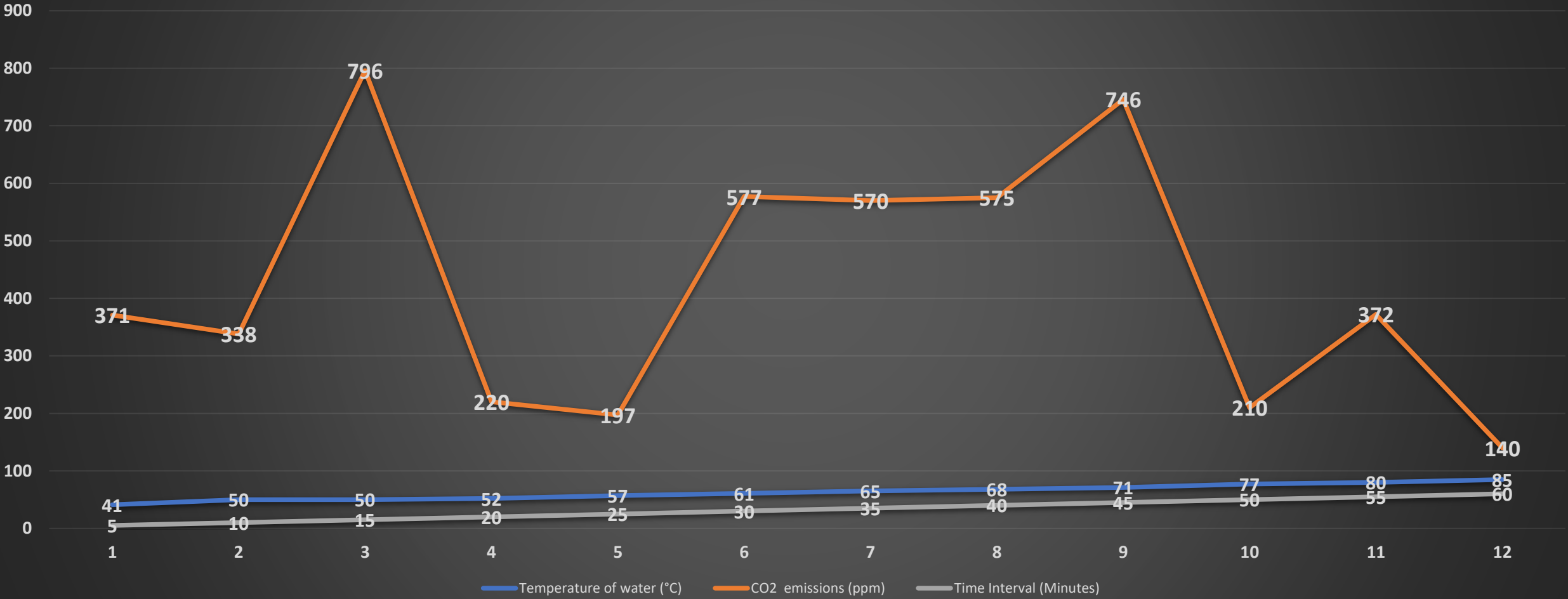
— Temperature of water (°C) — Time Interval (Minutes)  
X-Axis: Number of Intervals  
Y-Axis: Values Obtained





# AJPER STOVE

X-Axis: Number of Intervals  
Y-Axis: Values Obtained



## Most efficient result

# Energy Production Calculation

345 g of bio-briquettes was around 6 to 8 briquettes of different weights which were used to boil 5L of water. So total energy potential of this combination of briquette when added together ranges around 4000 to 8000 KJ approximately.

Dry Bio-Briquette Weight (g)	23% of Grass		77% of Cow Manure		Total Energy Potential of the Bio-Briquette (KJ)
	Portion (g)	Energy Potential (KJ)	Portion (g)	Energy Potential (KJ)	
35	8.05	117.53	26.95	417.725	535.25
45	10.35	151.11	34.65	537.075	688.18
55	12.65	184.69	42.35	656.425	841.11
65	14.95	218.27	50.05	775.775	994.04
75	17.25	251.85	57.75	895.125	1146.97



# Conclusions and Future Scope

01

With the application of bio-briquettes and efficiency stoves, the wood will be saved, as well as the health of the kitchen workers

02

Further R&D in Stoves, Press, modeling and experiments with bio-briquettes

03

Dealing with social problems like 'resistant to change' mindset

04

Establishment of a customer-friendly business plan

# References

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Thank You

Feedback Please!

BRIQUETS  
2000 g of Manioc  
500 g of grass

