

UNIVERSITY OF DAR ES SALAAM
COLLEGE OF ENGINEERING AND TECHNOLOGY



Stove Testing and Research Activities

Presented at:

THE EAST AFRICA IMPROVED COOKSTOVE COLLOQUIUM MEETING

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By: Dr.-Ing. Leonard M.P. Rweyemamu

Outline

- Overview of Stove Testing and Research activities at the College of Engineering and Technology
- Challenges

Overview of CoET and its Functions

- The College of Engineering and Technology (CoET) is a semi-autonomous campus College of the University of Dar es Salaam.
- It was established in 2001 through the integration and transformation of the Faculty of Engineering (FoE) and the Institute of Production Innovation (IPI).

Teaching

- The College offers four year undergraduate training leading to Bachelor of Science degrees in Engineering, BSc.(Eng).
- It also offers postgraduate degree programmes leading to Postgraduate Diplomas or Masters of Science in Engineering (MSc. Eng.) and Doctor of Philosophy (PhD)

Research

- The College has a number of on-going research activities, covering both basic and applied research.
- Basic research and development is done in the laboratories of the 6 academic units of CoET

Academic Units / Departments

1. Department of Transportation and Geotechnical Engineering,
2. Department of Water Resources Engineering,
3. Department of Structural and Construction Engineering,
4. Department of Electrical Engineering,
5. Department of Mechanical and Industrial Engineering, and
6. Department of Chemical and Mining Engineering

Innovations activities

- The College emphasize in Innovation which gives business, government and not-for-profit stakeholders the tools and confidence to lead the creation, and commercialization of meaningfully unique ideas.

Consultancy

- The Bureau for Industrial Cooperation (BICO) is the organ responsible for coordinating consultancy and services to industry within the College.
- It was established in 1990 under the former FoE with the sole aim of mobilizing expertise and resources for effective contribution to social-economic development of the country.

RE Energy Research Activities

- The departments mainly involved are the:
 - Department of Mechanical and Industrial Engineering
 - Department of Chemical and Mining Engineering

Research Facilities

- Laboratories with facilities for fuel analysis including proximate and element analysis of fuel, incl. AAS
- Flue gas sampling and analysis, e.g. Orsat analysers and flue gas analysis kits
- Bomb calorimeter
- Thermocouple devices for temperature measurement

CoET Expertise in RE

- CoET has a track record of conducting research in:
 - renewable, conventional, and biomass energy
 - energy efficiency
 - bio-energy development
 - innovation systems
 - environment, climate change
 - policy analysis

Research Results Dissemination

- CoET has a good track record of disseminating research results to the rural poor through outreach programmes, which include:
 - Technology incubation
 - Cluster Initiatives (*Research-into-Use*)
 - SME clubs

Stoves Research and testing

- CoET is a member of **Policy Innovation Systems for Clean Energy (PISCES)** project
- This project is about new knowledge for sustainable bio-energy
- This Research Programme Consortium is funded by the UK's Department for International Development (DFID)

Biomass Improved Stoves Technology Research

- Rocket stove technology
 - Utilizing fuelwood
 - Efficient biomass technology for domestic and institutional cooking, food and agro-products drying, baking, roasting, and frying
- Biomass gasifier stoves
 - Rice husks gasifier stove
 - Utilizing rice husks and biomass pellets

Biomass Improved Stoves Technology Research

- Rocket stove performance improvement:
 - Effects of **combustion chamber insulation materials** and **secondary air** on the **thermal performance** and **emissions behaviour**
- Improvement of the performance of rocket dryer
 - Specific energy consumption reduction:
 - E.g. 35 kg fuelwood/kg tobacco (traditional barns) reduced to 3-5 kg fuelwood/kg tobacco (rocket stove barns)

Stove Performance Improvement Tests



Insulation materials research

- Mechanical stability/strength
- Thermal stability / high temperature stable (above 850°C)
- Light weight /low thermal conductivity



Biomass briquetting research

- Biomass briquetting
- Biomass pelleting



Challenges

- The College lacks own advanced emission analysis devices. Currently, these equipment has to be hired from other organisations, such TaTEDO

THANK YOU FOR ATTENTION

