LOWTECH-MICRO-GASIFIERS AS A SOLUTION FOR DEFORESTATION AND HEALTH PROBLEMS CAUSED BY INDOOR AIR POLLUTION

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A cooperation of
CHEMA Programme & Engineers Without Borders Germany

Agenda

- Background: Situation in Tanzania

- Approach: Introduction of Microgasifiers

- Different Models of Microgasifiers

- Testing Methods

- First Results

- Summary and Outlook

Background: Situation in Tanzania

Heavy usage of fuel woods and charcoal in Tanzanian households:
90 % of all primary energy consumed is biomass

Consequences:

- Deforestation
→ 412,000 hectares per year

- Health issues due to indoor air pollution
→ ca. 2 million people a year die prematurely from illness attributable to indoor air pollution

- Great time consumption for firewood collection

Background: Deforestation

Background: collection of firewood

Background: traditional cooking

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ENGINEERS WITHOUT BORDERS (Ingenieure ohne Grenzen e.V.) / Germany – Andrea Berten

Approach: Introduction of Microgasifiers

Switching to energy saving stoves can significantly decrease environmental destruction and prevent health problems!

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Approach: Introduction of Microgasifiers

Advantages:

- Higher efficiency

- Lowered usage of firewood

- Usage of other biomasses such as sawdust or coffee husks

- No smoke

- Low or no emissions and therefore decreased impact on health

- Charcoal as a byproduct

Different Models: CHEMA Rocket Stove

Features:

- Usage of firewood

- more efficient → saves 54 % of fuel wood

- Retains heat due to bricks

- Comes with a removable fuelwood stand and an adjustable skirt for optimal heat transfer to the pot

- works continiously

- no charcoal production

Different Models: Sawdust Stove

Features:

- Usage of sawdust,
  eventually coffee husks

- Works with batches
  → 1 batch lasts up to 3 hours

- Charcoal production

Different Models: TLUD - Mwoto

Features:

- Usage of firewood

- Adjustable primary air inlet
→ adjustment of the flame

- Works with batches
→ 1 batch lasts ca. 1 hour

- Charcoal production

Testing Methods: WBT and CCT

Waterboiling Test (WBT) for testing the efficiency

Controlled Cooking Tests (CCT) for testing the adequacy for local cooking habits

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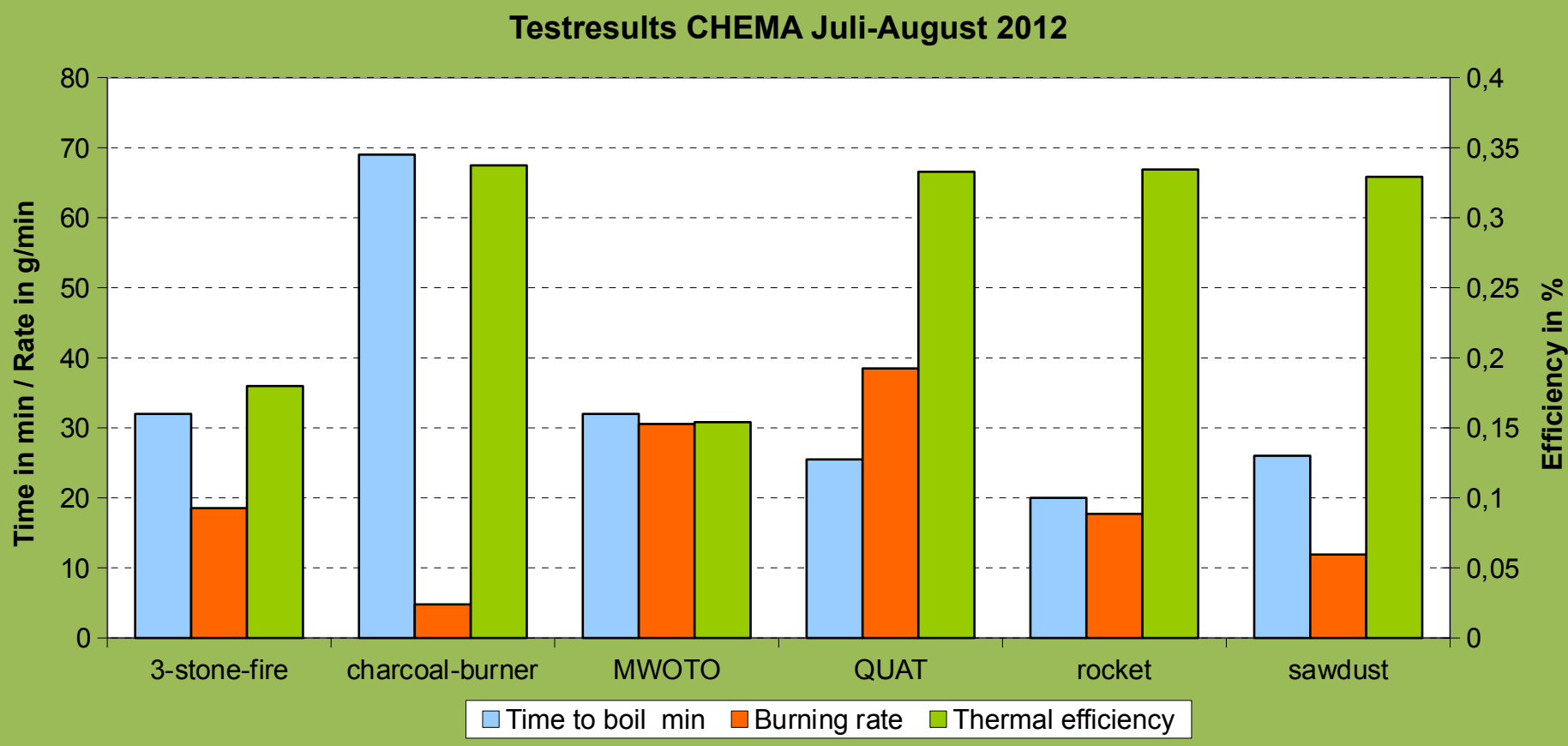
First Results



Summary and Outlook

Summary:

- WBTs and CCTs for first impression and comparison

- First feedback: locals are very interested

- Promissing solution of the problems

Outlook:

- Scientific proof of efficiency and emissions → comparison to Rocket Stove

- Tests with different types of biomass → especially with coffee husks

- Find, adapt or develop a model that is built for the necessities of the community

Thank you for your attention!

Questions?