

**MITIGATION OF CLIMATE CHANGE:
A CRITICAL EXAMINATION OF THE CHALLENGES OF
ADDRESSING ENERGY-RELATED DEFORESTATION**

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Presentation Outline

- Background and origin of Charcoal usage
- Deforestation - A Sting of Climate Change
- Challenges to addressing Energy - related deforestation
- Current efforts by Mzuzu University
- Way forward
- Conclusion and Recommendations

Background and Origin of Charcoal usage

- Historically, charcoal production is not a new phenomena as it dates way back to the stone age era before Christ (B.C.).
- The early man used charcoal to a large extent to make hoes, axes and other pieces of metal. However, the felling down of trees for charcoal was sustainable due to the very small population that existed then.
- However, in this 21st Century, the situation has changed drastically. For instance, in 1964 Malawi had a population of only 4 million as opposed to the present population of well over 15 million people living on the same size of land.

- Apparently, sustainable wood supply is surpassed by 3.7 million tonnes per year (Department of Energy Affairs, 2006}. As alluded above, Charcoal and firewood have been in use since the existence of man and were sustainable.
- Although climate change and climate variations have not been assessed with certainty, the impacts of deforestation are notable as recent climate abnormalities such as droughts and floods bear witness that the climate is indeed changing.

Deforestation - A Sting of Climate Change

- Malawi's high growth of population is leading to excessive demands on natural resources that exceed the generative and assimilative capacity of the environment.
- One of the major causes of climate change are human activities, such as the destruction of forest reserves through wanton cutting down of trees and illegal charcoal production.
- The demand for land for new settlement, firewood, new development programmes and more food production have resulted in clearance of huge areas of forest land, e.g., in Lilongwe, Kasungu and Mzimba districts.

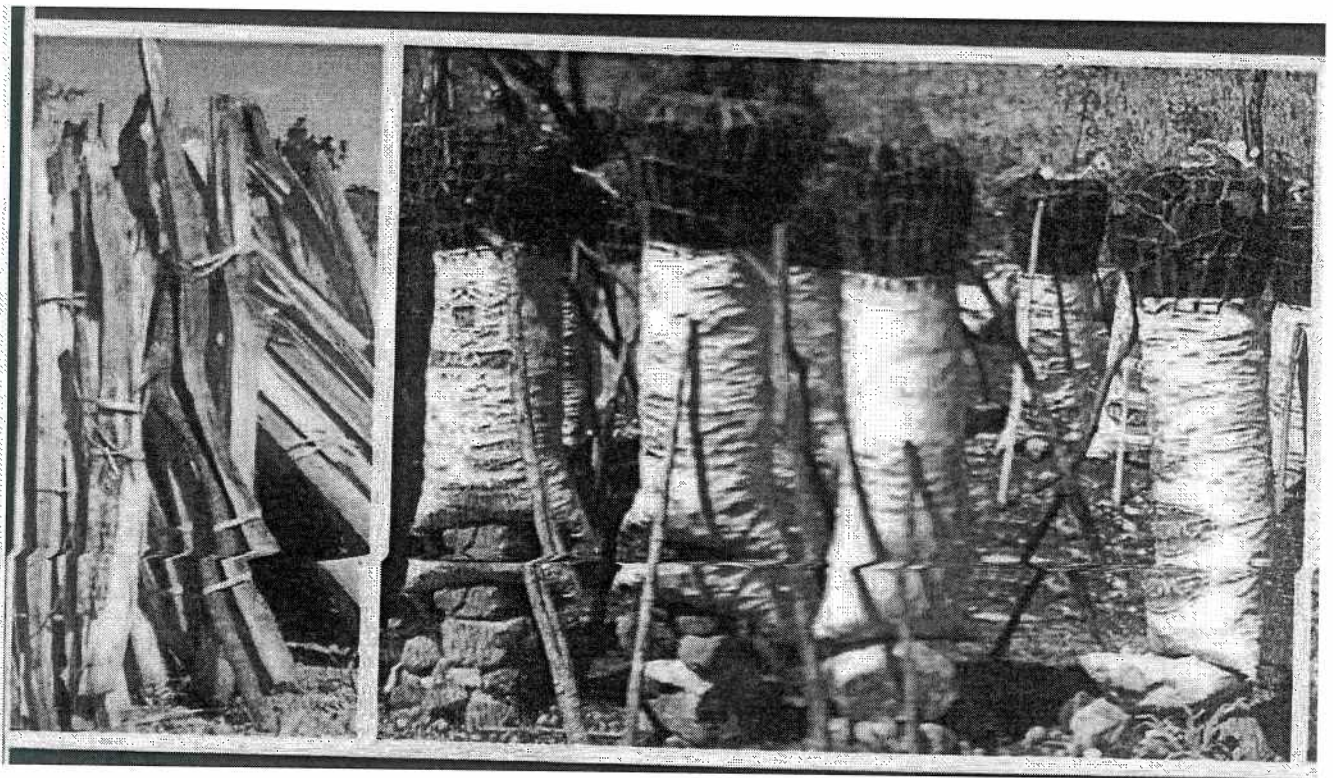
Adverse effects of Deforestation

- Trees gives us fresh air and indeed enrich the soil. As vegetation is removed in a large - scale, carbon dioxide accumulates in the atmosphere contributing to *global warming*.
- Such unfovaourable local and worldwide changes in climate negatively effects the country's Agricultural productivity through untimely, erratic, and insufficient rains.
- In addition, removal of forests creates a gap in the water cycle resulting in unreliable and sporadic rain.

Challenges to Addressing Deforestation in Malawi

- **Fighting the problem:** We should not fight the problem but rather *address the problem* - recovering charcoal assumes the people have alternatives.
- **Lack of appropriate alternatives:**
 - Low access rate to electricity, capital cost of accessories for electric cooking.
 - Capital costs for biogas technologies.
 - Unreliable supply chain for briquettes and briquette stoves.
- **Lack of livelihood thinking :** Exclusion of charcoal supply chain players in development of supply chain of alternative energy sources- *think of taking the charcoal producers to produce and sell the briquette so that they can continue to pay for the cost of living .*

Efforts by Mzuzu University(Mzuni) towards Addressing Deforestation

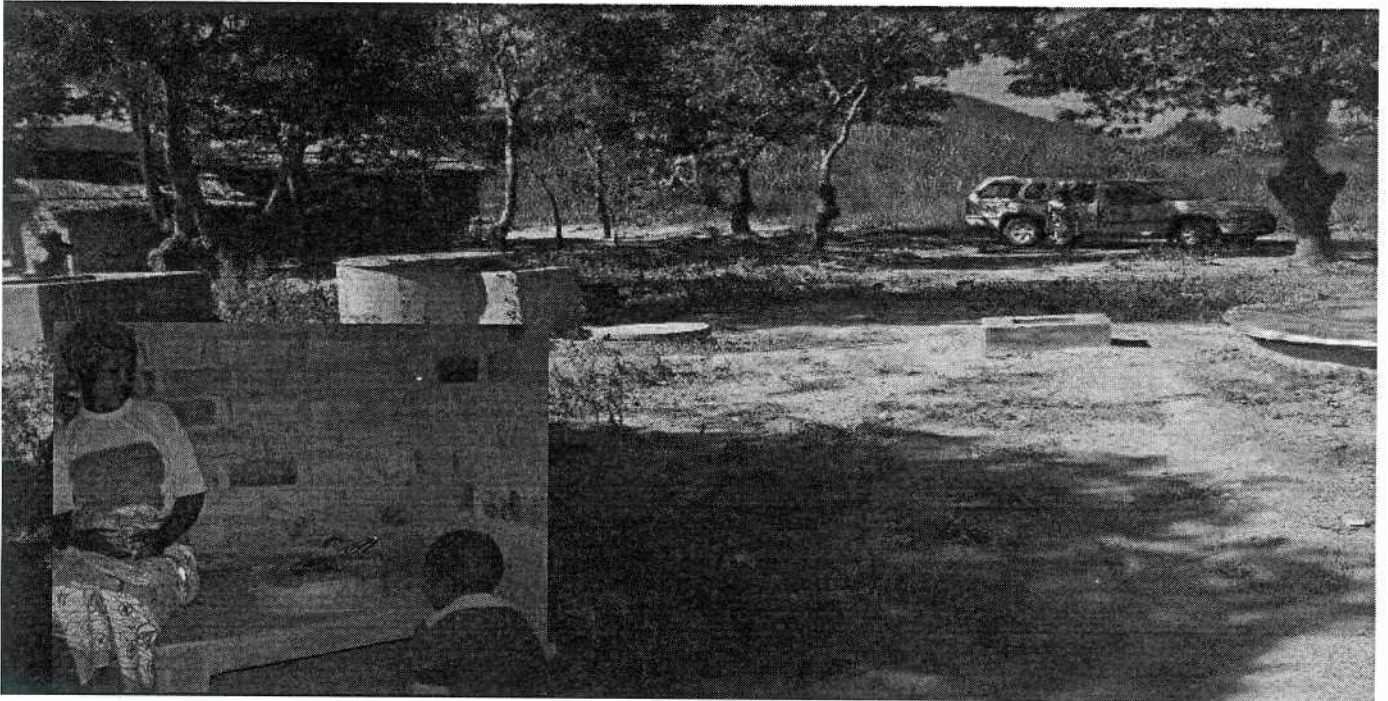


Source : CLAIM (2012)

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- Combating Deforestation in Malawi needs Multi-sectoral approach where the government of Malawi in collaboration of NGOs, Churches, Schools and local communities need to join hands in its fight.
- **Mzuzu University** (Mzuni) is already tacking a leading role in combating deforestation .
- For instance, **Mzuni** has established the Department of **Energy and Renewable Technologies** which offers both degrees and short courses in this field.
- Theoretical and practical skills in designing, installation and maintenance of renewable energy systems such as hydro, solar, biomass, bio-fuel and Biogas are taught.
- But perhaps, more importantly, the department has for sometime been working closely with communities in Choma area on the use of various renewable energy technologies.

Community Outreach Projects Promoting Biogas



A biogas plant in Choma: Over 30 biogas plants have been built by Mzuzu University's Department of Energy Studies in Mzimba, Nkhata Bay, and Mchinji; Empirical research shows that every biogas plant saves an average of 1.8 tonnes of wood per year.

Source: Collen Zalengera, 2014.

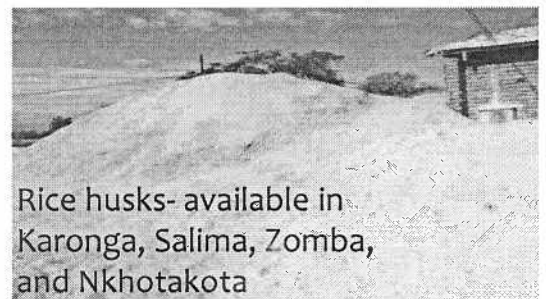
Way Forward

- Support research to make biogas technology affordable by an ordinary Malawian.
- Biogas technology for a range of bio-degradable waste such as food wastes, and market wastes such as vegetable wastes, potato pills, fruit wastes
- Rice husks for energy production
- Biogas in schools and prisons
- Hot springs to supply hot water
- Solar water heaters in hospitals

Locally Fabricated Solar Water Heater



Source: Colleen Zalengera (2014)



Rice husks- available in Karonga, Salima, Zomba, and Nkhotakota



A hot spring in Chiweta, Rumphi- over 20 in Malawi with water above 40 degrees Celsius

Conclusion and Recommendations

- There's no single method or approach to address deforestation through charcoal vending that can be successfully employed. The need for a multi-sectoral approach therefore need not be over-emphasized.
- However, there's need for a strong political will , e.g., by intensifying **afforestation** and ensuring that every year the International Day of Forests {tree planting} is observed on 21st March for our human existence. In Malawi, this day is observed on 21st January because that is the time when most parts of the country receive heavy rains.
- **The time for talking has passed.** Emulate and learn lessons from past programmes some 15 years ago, e.g., **Making Malawi green** where people in the communities exchanged bottle tops with tree seedlings which was to a greater extent a success story, e.g., Communities around Nkhorongo, Doroba, and Choma north of MZUZU City.
- Support research and projects of appropriate alternative technologies.

Conclusion and Recommendations

- Train and empower the local communities on how best to manage their forest reserves through **Community Based Natural Resources Enterprise (CBNRE)** where they can strengthen by-laws against charcoal production.
- Since rapid population growth in Malawi is causing severe resource depletion and environmental degradation, government and NGOs should promote use of **fuel saving stoves in urban areas**. For example, **China** has already pioneered in this field of **renewable energy** and saves 40% of its heating energy { D+C. (2015) CHINA AND HEATING ENERGY, p.18}.
- On 'Afforestation', local communities/ villages should be provided with seedlings at an affordable price. Also, there's need for a consented effort to replenish the **Vipya/Chikangawa Forest Reserve**, the one time biggest Man-made Forest and glory of Africa second to Canada, and/or Finland.
- On income generating, empower villagers to establish clubs in small groups of about ten to fifteen people per club, e.g., on vegetable gardening or chicken rearing on a commercial basis.
- **Engage charcoal producers in supply chain of alternative energy sources - they do it for livelihood (any expert on project stakeholder analysis would not miss this).**

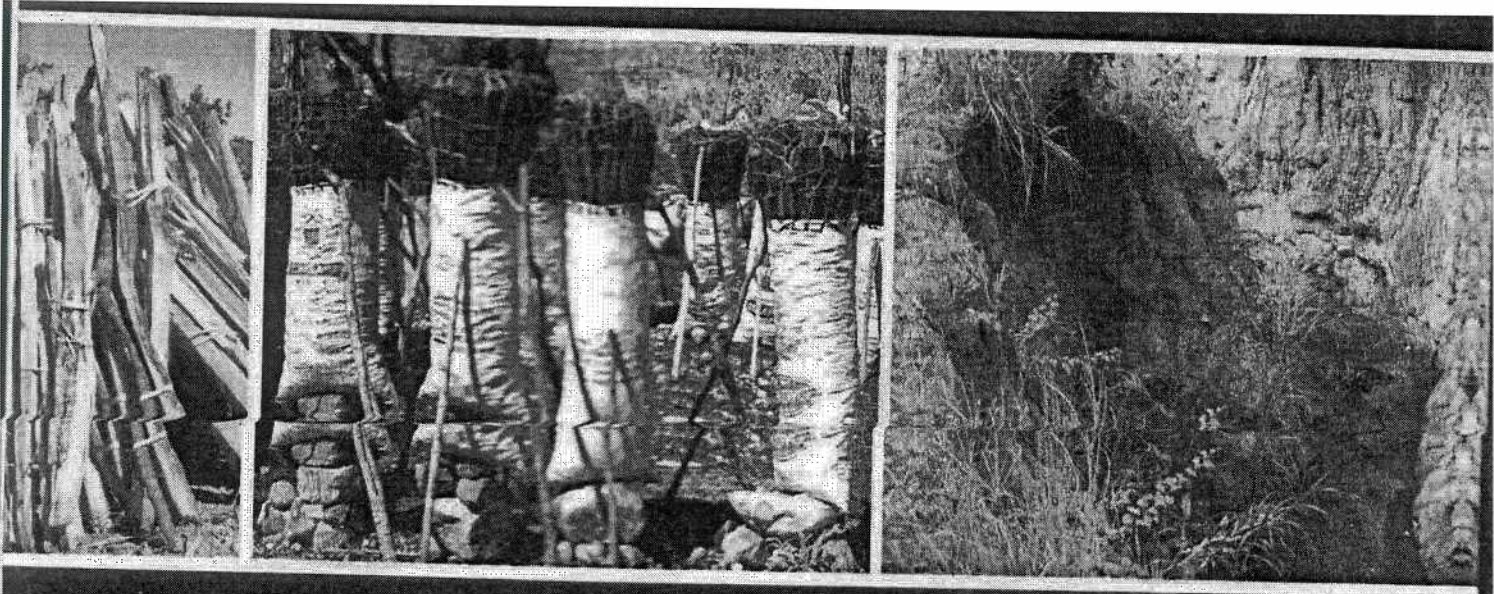
Thank you

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References

1. **D+C (2015) CHINA AND HEATING ENERGY.** Bonn: Development and Co-operation, p.18.
2. **Department of Energy Affairs.** (2006). *Promotion of Alternative Energy Sources Project Document* . Lilongwe: Ministry of Natural Resources, Energy and Mining .
3. **Zalengera, Collen,** et al. (2014) Overview of the Malawi Energy Situation and a PESTLE Analysis for Sustainable Renewable Energy Development, *Renewable and Sustainable Energy Reviews*,38, 345-347.
4. **Zalengera, C.** (2010) Impact of Renewable Energy on Sustainable Livelihood in Malawi, Conference Paper Presented at the COMESA/ SADC Youth Conference on Climate Change, 17th - 19th November 2010, Cresta Hotel, Malawi .
5. **Zalengera, C.** (2015) Diffusion of Innovations in Energy Infrastructure Development , Presentation at the 2015 Annual Engineers Conference, Sunbird Nkopola Lodge, 3 September 2015 .
6. **UNFPA/UNESCO (1998) A Students' Handbook for Population Education in Malawi.** Domasi: Malawi Institute of Education.

APPENDIX



Careless cutting down of trees for firewood and charcoal is the biggest threat to the environment. This situation needs to be reversed before it is too late.

Gullies are a result of deforestation. For every tree cut down, ten trees should be planted.

Source : Comprehensive ATLAS for schools. A Thematic Approach. Blantyre: CLAIM (Mabuku),

About the Corresponding Author:

A brief resume of Docks Richard JERE (Mr.)

Mr. Jere , a retired University Lecturer and formerly of Mzuzu University (Mzuni) which is one of Malawi's Premier Public Universities, has taught Courses in Educational Research Methods, Curriculum Studies, and Testing, Measurement and Evaluation. He started his career as a teacher and later became a Science Education Tutor at Lilongwe Teachers' Training College for two years. Mr. Jere first obtained an Advanced Certificate in Education designed for Teacher Trainers from the University Of **Bristol** School Of Education in the UK. He then obtained his BA (Ed) degree from the University of **Hull** in 1980 majoring in Educational Assessment and Statistics and subsequently earned a Master's degree in Education in 1982 from the University of **Reading** also in the UK. Later, during the 1992 Fall Semester he also studied for other Advanced Courses in Research and Evaluation at the University of Wisconsin – **Green Bay** in the USA. In the 1980s, he worked at the Malawi National Examinations Board (MANEB) in the Testing and Research Department and rose to the position of an Assistant Director. Prior to joining Mzuni, he had also worked at the Malawi Institute of Education (MIE) as an Assistant Director Responsible for Curriculum Development, Research, and In-service Training (INSET) Programmes for 10 years. In the 1990s, during this same period he also co-edited two Text Books of Population Education materials designed for schools and colleges in Malawi. In addition, while at MIE, he also served as the Project Coordinator and Team Leader for the USAID funded Improving Education Quality Project (IEQ) prudently from January,1999 to Y2002, Similarly, while working at Mzuni as a Lecturer, Mr. Jere also Co-ordinated successfully for five years the Secondary School Teacher Improvement Programme (SSTIP) (i.e. from Y2004 – Y2008) with funding from the African Development Bank (AfDB). The SSTIP was specifically designed for Teachers teaching Mathematics and Science subjects in the Community Day Secondary Schools (CDSSs) in Malawi. To share his work, he has published in reputable peer reviewed journals and publications. He is widely travelled in Eastern and Southern Africa, Rio de Janeiro - Brazil, the United Kingdom, and as well as in the USA.