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LIFE CYCLE SUSTAINABILITY ASSESSMENT OF SELECTED ETHIOPIAN BIOENERGY SUB-SECTORS



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The research work first looked at the available bioenergy potential in the country from different biomass residues. After estimating the available potential, the study looked at specific bioenergy type's potential, and their environmental and socio-economic sustainability.

The first bioenergy type, which was analyzed for its environmental and socio-economic sustainability was biogas production in specific region of Ethiopia called Amhara region.

The study results showed a better performance environmentally as well as socio-economically as compared to the traditional biomasses; wood, dung and agricultural residue.

The second bioenergy type addressed in this research work was sugarcane molasses-based ethanol production. The detailed environmental and socio-economic sustainability was assessed following the well-established life cycle assessment methodology.

The results compared with other similar studies in Thailand and other countries as well.

As part of the research, I had an opportunity to go to CIRAD, France, for six months to get hands on experience with the international community. Results of my research work led to 4 international journal publications.

International publications



1. Gabisa EW, Gheewala SH. 2018. Potential of bio-energy production in Ethiopia based on available biomass residues. *Biomass and Bioenergy*. 111: 77-87
2. Gabisa EW, Gheewala SH. 2019. Biomass and Bioenergy Potential, environmental, and socio-economic assessment of biogas production in Ethiopia: The case of Amhara regional state. *Biomass and Bioenergy*. 122: 446-456.
3. Gabisa EW, Bessou C, Gheewala SH. 2019. Life cycle environmental performance and energy balance of sugarcane molasses based ethanol production in Ethiopia. *Journal of cleaner production* (Published)
4. Can substitution of imported gasoline by locally produced molasses ethanol in Ethiopia be sustainable? An eco-efficiency assessment. *Renewable and sustainable energy reviews* (Published)