

Quantifying and Prioritizing Agricultural Residue Biomass Energy Potential in Ethiopia

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Abstract : The energy demand boost in Ethiopia urges sustainable fuel options while it is mainly supplemented by traditional biomass and imported conventional fuels. To satisfy the deficiency it has to be sourced from all renewables. Thus identifying resources and estimating potential is vital to the sector. This study aims at an in-depth assessment to quantify, prioritize, and analyze agricultural residue biomass energy and related characteristic forms. Biomass use management and modernization seeks successive information and a clue about the resource quantity and characteristic. Five years of crop yield data for thirteen crops were collected. Conversion factors for their 20 residues are surveyed from the literature. Then residues amount potentially available for energy and their energy is estimated regional, crop-wise, residue-wise, and shares compared. Their potential value for energy is analyzed from two perspectives and prioritized. The gross potential is estimated to be 495PJ, equivalent to 12/17 million tons of oil/coal. At 30% collection efficiency, it is the same as conventional fuel import in 2018. Maize and sorghum potential and spatial availability are preeminent. Cotton and maize presented the highest potential values for energy from application and resource perspectives. Oromia and Amhara regions' contributions are the highest. The resource collection and application trends are required for future management that implicates a prospective study.

Keywords : crop residue, biomass potential, biomass resource, Ethiopian energy

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