

Assessing the Spatial Availability and Distribution of Crop Residues for Energy Production

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Key words: Spatial planning; Sustainability

SUMMARY

Abstract

Northern Uganda generates considerable volumes of crop residues across the agricultural value chain, and converting these residues into energy offers a viable pathway for advancing the region's clean energy transition. However, sustainability is challenged by competing uses. This study assessed the availability and alternative uses of crop residues in Amuru District, Adjumani District, and Gulu City using a cross-sectional design and mixed-method approach. Data were collected through structured questionnaires and in-depth interviews, identifying rice husks, maize cobs, groundnut shells, and sawdust as the most prevalent residues. The findings revealed that these residues are predominantly utilized for livestock feeding and bedding, which significantly constrains their potential as feedstock for energy production. Although agricultural residues are abundant, their diversion to other uses limits the feasibility of residue-based energy solutions. Addressing this challenge requires strategic resource mapping to guide allocation, formulation of local policies for sustainable residue management, and community engagement to enhance awareness of clean energy benefits. Additionally, investment in infrastructure for efficient residue recovery and processing is essential to ensure a consistent supply for energy conversion initiatives. Balancing these competing demands is critical to realizing the full potential of agricultural residues as a sustainable energy resource in Northern Uganda.

Keywords: crop residues, clean energy, sustainability, competitive uses, Northern Uganda