

## Energy Analysis of Sugarcane Production: A Case Study in Metehara Sugar Factory in Ethiopia

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**Abstract :** Energy is one of the key elements required for every agricultural activity, especially for large scale agricultural production such as sugarcane cultivation which mostly is used to produce sugar and bioethanol from sugarcane. In such kinds of resource (energy) intensive activities, energy analysis of the production system and looking for other alternatives which can reduce energy inputs of the sugarcane production process are steps forward for resource management. The purpose of this study was to determine input energy (direct and indirect) per hectare of sugarcane production sector of Metehara sugar factory in Ethiopia. Total energy consumption of the production system was 61,642 MJ/ha-yr. This total input energy is a cumulative value of different inputs (direct and indirect inputs) in the production system. The contribution of these different inputs is discussed and a scenario of substituting the most influential input by other alternative input which can replace the original input in its nutrient content was discussed. In this study the most influential input for increased energy consumption was application of organic fertilizer which accounted for 50 % of the total energy consumption. Filter cake which is a residue from the sugar production in the factory was used to substitute the organic fertilizer and the reduction in the energy consumption of the sugarcane production was discussed

**Keywords :** energy analysis, organic fertilizer, resource management, sugarcane

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