Sugarcane Production

Environmental Impacts and Socioeconomic Issues

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Editors

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CHAPTER 9

Plant Biomass to Bioenergy: Use and Impact on Environment and Development

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ABSTRACT

The exhaustion of fossil fuel reserves and increasing atmospheric environmental pollution and climate change have heightened the quest for sustainable alternatives. Within these options, biofuels from plant biomass have emerged as a better alternative. This chapter provides the accessibility of plant biomass to substitute fossil fuels with biofuels. The initial part delineates the environmental advantages of biofuels, including their ability to lessen greenhouse gas emissions and reduce reliance on limited fossil fuel reserves. Subsequently, the conversation delves into the various origins of plant biomass, spanning from specialized energy crops. The quantity and dispersion of raw materials are assessed, considering geographical differences, land accessibility, and farming efficiency. The technological progressions in biomass transformation, encompassing biochemical and thermochemical responses, are discussed. These processes include fermentation, pyrolysis, and gasification, which convert lignocellulosic

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