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Developing Short-Rotation Woody Biomass Feedstock in the Philippines: Strengths, Weaknesses, Opportunities, and Threats

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Abstract

Biomass energy attracts the attention of researchers, investors, developers, and policymakers because of its potential to promote local and national economies, alleviate poverty, and mitigate climate change impacts. Most biomass power plants in the Philippines derive their fuels from agricultural wastes, such as rice hulls, bagasse, coconut husks, and other agricultural wastes. However, the seasonal and limited availability of these sources are limitations for ensuring a continuous flow of raw materials supply to support an uninterrupted operation of a biomass power plant. Developing an intensive biomass feedstock farming system using short-rotation biomass crops provides opportunities for increasing productivity of marginal areas and unproductive agricultural lands, ensuring the sustainability of biomass feedstock supply for the biomass energy sector in the country, alleviating poverty, promoting rural economy, and mitigating climate change impacts. The humid tropical warm climate in the Philippines offers a favorable growing environment for year-round biomass production of some fast-growing short-rotation woody biomass crops, such as Ipil-Ipil (*Leucaena leucocephala*) and Kakawati (*Gliciridia sepium*). The country also legislated enabling laws to promote renewable energy and marketing opportunities for biomass farmers and investors. The limited science-based information concerning the sustainability of biomass energy production and the lack of scientific investigation on the potential of developing short-rotation woody biomass crops result in poor outcomes and unsustainable biomass investments. Furthermore, the long waiting period for return on investments, large investment costs during establishment, and large area requirements needed for establishing biomass plantations must be addressed to ensure the profitability, participation of biomass farmers, and interest of investors. At present, the government's voluntary commitment under the Conference of Parties (COP) 21 to reduce greenhouse emissions by 70% for the next five years and the increasing market demands for biomass provide huge opportunities for biomass investments in the country. However, these opportunities could be influenced by the changing local, national, and geopolitical political dynamics and technological advancement of other renewable energy sources, like solar, wind, nuclear, and wave, affecting demands, markets, and prices. This study contributes to understanding the feasibility and sustainability of developing a large-scale short-rotation biomass feedstock production in the country, which is a vital piece of information for informed policy and decision-making and for promoting the biomass industry in the country.

Key Words: Renewable Energy, Climate Change, Fast-growing Trees, Sustainable, Biomass Energy

