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Economic Viability for Jatropha Production at India's Wastelands: A Scenario Analysis

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Abstract

India's increasing energy consumption resulting from its economic growth and the expanding transportation sector will contribute to Global Warming. This research investigates the potential of Indian agro fuel, especially Jatropha based fuel production on wastelands. Further we discuss, how the potential of Jatropha can be made accessible for landless and poor farmers as well as how Jatropha fuel could support India's transportation fuel and energy demands more CO₂ neutral.

In this analysis a benchmark price for Jatropha fuel competitiveness to fossil diesel is assessed and translated into a maximum price for Jatropha seeds using a value chain approach. As Jatropha fuel options we compare Jatropha pure plant oil (JPPO) and Jatropha methyl ester (JME) according their production costs. The calculated maximum price for Jatropha seeds is used to link the Jatropha fuel alternatives with the Jatropha seed production scenarios. To measure the economic viability of three different cost scenarios (low cost, baseline and high cost) we apply financial analysis and compare the different net present values.

As our focus is to estimate at which range of crude oil prices and interest rates Jatropha seed production becomes economically viable results show that Jatropha fuel production become competitive to fossil diesel if crude oil prices reach levels above US\$ 75 per barrel (low cost scenario JPPO, interest rate 6%). Even as JME has higher production cost as JPPO we conclude that both have the potential to serve as renewable energy source, but a higher value for Jatropha farmers could be achieved with JPPO production.

We conclude that, the economic viability of Jatropha fuel can and has to be increased through improved breeding regarding yields and oil content, lowering of production costs, increasing processing efficiency and the development of decentralised JPPO usage as fossil diesel substitute. Further, the findings suggest that the Indian state and federal governments need to provide assistance and clear framework conditions for the future to allow the diffusion of Jatropha fuel production in India.

Keywords: Agro fuel, bio fuel, India, *Jatropha curcas*, renewable energy, wasteland