

Bio-diesel from *Jatropha*: the life-cycle prespective

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The pantropic oil-bearing tree *Jatropha curcas* L. (JCL) receives a lot of attention from project developers in the field of biofuel production and Clean Development Mechanism. As a pioneer species well adapted to arid and semi-arid climates JCL is attributed to simultaneously reclaim wasteland, produce bio-diesel and enhance socio-economic development in degraded areas in the South. As such, bio-diesel production and use from JCL is believed to have a positive environmental and socio-economic impact although no quantitative studies are available to confirm this. Life Cycle Assessment (LCA) is seen as the best instrument to investigate the environmental impact of such production system. LCA studies the environmental aspects and potential positive and negative impacts throughout a product's life (i.e. cradle-to-grave) from raw material acquisition through production, use and disposal. All inputs used and outputs generated in the complete JCL production process are inventoried, evaluated and accounted with respect to certain impact categories. For bio-diesel production the energy balance (how much energy is primary put into the process and how much comes out) and impact on global warming (the reduction of greenhouse gas emissions in tons CO₂ equivalents by the use of bio-diesel in stead of fossil diesel) are very relevant impact categories, together with the land use impact category. In land use impact assessment the life-cycle impacts on soil, water, vegetation structure and biodiversity are evaluated. In order to make a LCA on the bio-diesel production from JCL (well-to-wheel) all inputs and outputs of all different steps in its life-cycle –including seed production, pressing, esterification, distribution– should be identified and quantified. This paper will give an overview of the main experiences and knowledge gaps related to the life-cycle of bio-diesel from *Jatropha*.

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