

Topic: Assessment of Kamani Biodiesel in Indonesia Based on Life Cycle Perspective

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ABSTRACT

Kamani or *Calophyllum inophyllum* is a non-edible seed that has the potential to be a feedstock for biodiesel. Kamani trees are mostly found around coastal areas and are also known as forest trees. Kamani seed can be a promising alternative feedstock due to its high oil yield, simple cultivation procedure and non-edible seeds whereas palm oil which is currently used as biodiesel feedstock has environmental concerns and it is also produced for food thus raising issues about food versus fuel. The analysis of the energy inputs and outputs from kamani biodiesel show that its production is efficient because energy from output is higher than the input. Kamani biodiesel can also be considered renewable because its renewability factor at 5.52 (kamani biodiesel only) and 12.57 (all products) are substantially higher than 1. The study also assessed environmental impacts such as climate change, human toxicity, photochemical oxidant formation, particulate matter formation, particulate matter formation, terrestrial acidification, marine eutrophication, terrestrial ecotoxicity, freshwater ecotoxicity, marine ecotoxicity and fossil depletion. Those impacts were calculated by considering all emissions that came from life cycle of 1 ton kamani biodiesel production. The external costs of kamani biodiesel is higher than palm biodiesel but the price per liter of kamani biodiesel is slightly cheaper than palm biodiesel because of palm biodiesel production costs is higher.

Keywords: kamani, biodiesel, net energy balance (NEB), renewability factor, impact assessment