

RESEARCH CATALOGUE

ENVIRONMENTAL
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LIFE CYCLE ASSESSMENT OF BIOPLASTICS PRODUCTION IN THAILAND



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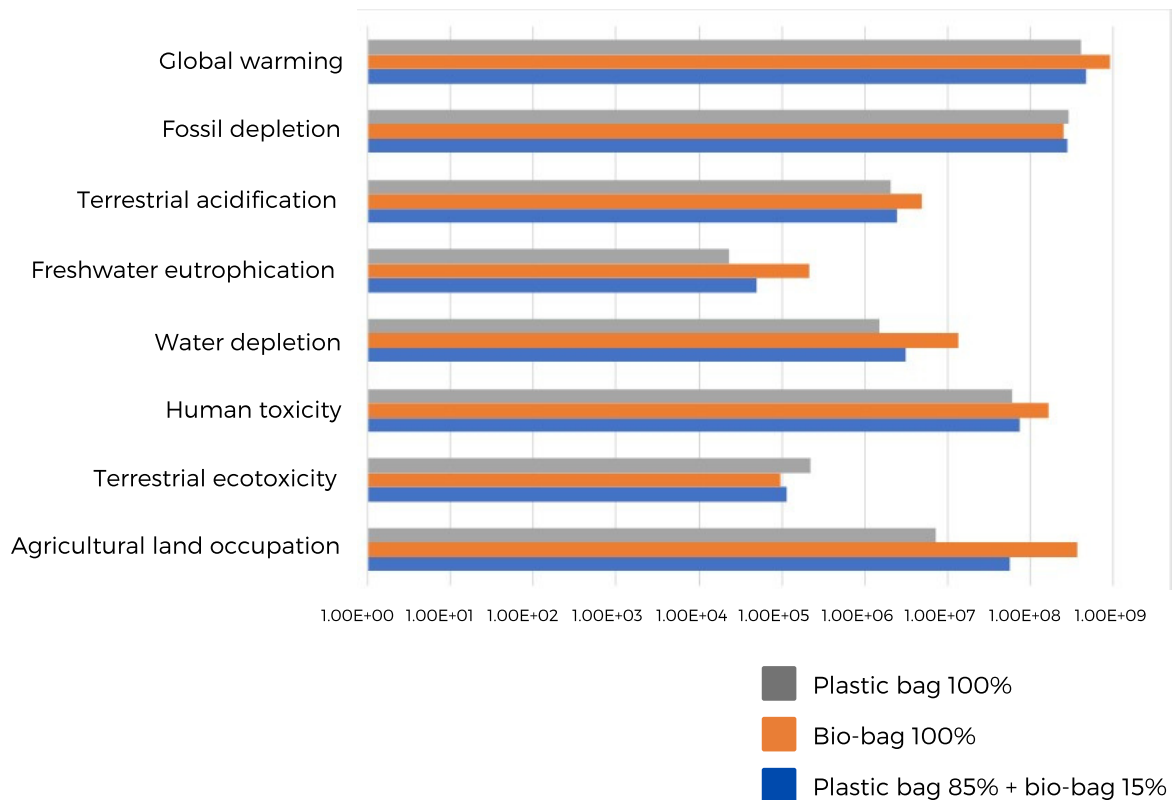
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The research work was performed during 2016-2018 and aimed at assessing the environmental impacts in terms of global warming, fossil depletion, water depletion, land occupation, acidification, eutrophication, and toxicity of single-use carrier (shopping) bags produced from conventional plastic (high-density polyethylene) and bioplastic (polylactic acid) and to find pros and cons of both products by applying the Life Cycle Assessment (LCA) tool. Moreover, this study also considered different waste management options following the end-use of the product.

The study showed that bioplastic bags have higher environmental impacts than plastic bags for all the categories investigated. The stage contributing most significantly to the environmental impact categories considered is the polylactic acid resin production step. One of the main reasons for bioplastic bag production to have higher environmental impacts than plastic bags is material requirement. It is about twice that of petroleum plastic bags. However, since bioplastic bags use local (agricultural) resources, they are attractive for fossil fuel-importing countries like Thailand.



The results of this study are useful for policymakers to take adequate decisions in the design of waste management schemes and for bioplastic producers to improve their production processes. This research work has been published in the Journal of Sustainable Energy and Environment of JGSEE.