

Modelling and Optimization of Biomass to Bio-Products Supply Chain

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EXTENDED ABSTRACT

Supply chain of biomass is one of the major areas that has direct influences towards biomass utilization activities and commercialization progresses. In this paper, an optimization model of biomass to bio-products supply chain was formulated by considering several cost factors such as biomass cost, production cost and transportation cost. A superstructure that has assisted in the model's formulation provided alternatives in the biomass processing routes which in turn aiming for profit maximization. It has involved a biomass-based manufacturing company in southwestern Ontario which was looking for business expansion and product portfolios' improvements. Optimal results indicated that an annual profit of \$ 22,618,673 was expected to be achieved, and this value was contributed mainly by the sales of bio-filler, bio-ethanol and by-product from the milling plant. The developed model offers flexibilities in biomass resources utilization and technological uses. Even though it was modeled and optimized specifically for the company in Ontario, Canada, the general framework of the optimization model is however could be applicable for different parts of the world including Asia.

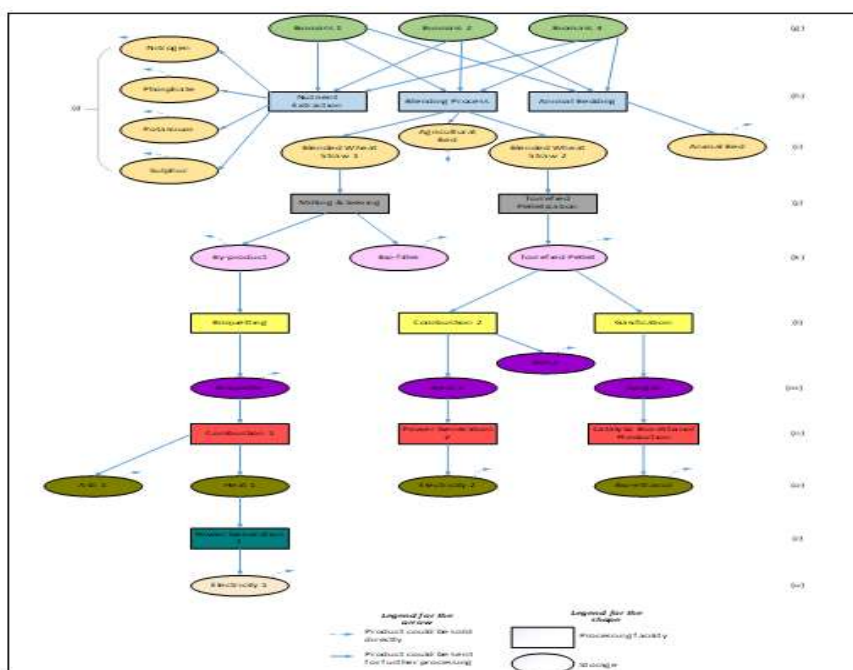


Fig. 1: Optimization model's superstructure.

Keywords: Biomass supply chain; bio-products; Modelling; Optimization; Bio-filler; Bio-ethanol.
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