

Title: Forest-based biomass: opportunities, challenges and supply chain modeling

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Forest-based biomass can be used as feedstock to produce value-added products in bioconversion facilities. When it is used as a renewable source of energy, it has the potential to reduce dependency on fossil fuels, decrease emissions and create jobs in forestry-dependent communities. Moreover, it could generate additional revenue streams for the forest sector. Despite these advantages, utilization of forest-based biomass in many regions is limited due to its low bulk density, high moisture content, low energy value and seasonal and dispersed availability. These characteristics contribute to high preprocessing, handling, storage and transportation costs and make its supply chain complex and costly. Furthermore, variations in forest-based biomass supply amount and quantity, and demand add additional complexity to its supply chain planning. In order to improve the competitiveness of forest-based biomass as a feedstock, supply chain management and optimization have been done in previous studies. In addition to economic feasibility, the environmental and social impacts of this renewable source are other key factors in sustainable planning. This talk presents the different approaches that have been used to model and support forest-based biomass supply chain decisions. Additionally, the recent trends in integrating economic, environmental and social impacts in supply chain models are explained. Finally, the hybrid approaches that have been used to incorporate multiple objectives as well as uncertainties in different parameters are discussed.