# Performance analysis of log yards using data envelopment analysis

## Abstract

Warehouse performance is of strategic importance in supply chain management, and as such, it has been thoroughly studied in the literature. In comparison, the performance of log yards, which are specific cases of warehouses, has attracted limited attention. While log yards only account for approximatively 6% of direct harvesting and logistics costs, their influence on value creation is critical. The aim of this paper is therefore to investigate log yard performance, more specifically with regard to: 1) technical efficiency, 2) design characteristics, and 3) management best practices.

A benchmarking analysis of 38 log yards in Quebec, Canada, was conducted.  Data Envelopment Analysis (DEA) served to measure technical efficiency in regard to three inputs factors (area, equipment, labor), and one output factor (annual volume). Scores were computed using an input-oriented model with, and without weights restriction. The combined influence of three design characteristics (seasonality, site shape index, and number of log assortments) on log yard efficiency was analysed.

The sources of inefficiencies are both scale and technical related. The results suggest a possible reduction of input consumption of 31%, 22% and 18% respectively for area, equipment and labor utilization. Considering the inputs weights, log yard technical inefficiency is mainly due to an inadequate utilization of area and equipment, suggesting that these issues are the most important in log yard design's improvement.

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