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# Operations Research for green logistics “ An overview of aspects, issues, contributions and challenges

Rommert Dekker <sup>a</sup> ... Ioannis Mallidis <sup>c</sup>

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### Abstract

The worldwide economic growth of the last century has given rise to a vast consumption of goods while globalization has led to large streams of goods all over the world. The production, transportation, storage and consumption of all these goods, however, have created large environmental problems. Today, global warming, created by large scale emissions of greenhouse gasses, is a top environmental concern.

Governments, action groups and companies are asking for measures to counter this threat. Operations Research has a long tradition in improving operations and especially in reducing costs. In this paper, we present a review that highlights the contribution of Operations Research to green logistics, which involves the integration of environmental aspects in logistics. We give a sketch of the present and possible developments, focussing on design, planning and control in a supply chain for transportation, inventory

of products and facility decisions. While doing this, we also indicate several areas where environmental aspects could be included in OR models for logistics.

## Highlights

- ° Operations Research contributes to green logistics in many ways.
- ° Green transportation also implies efficiency in using transportation equipment.
- ° Efficiency created by Operations Research helps to reduce greenhouse gas emissions.
- ° Operations Research methods can show the trade-offs between costs and emissions.
- ° OR methods can optimize supply chains with the most environmental friendly set-up.



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## Keywords

Environment; Logistics; Supply chain management; Transportation

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