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Analysis of the factors stimulating and conditioning application of reverse logistics in construction

Anna Sobotka^a, Joanna Czaja^{b*}

^{ab} AGH University of Science and Technology Al. Mickiewicza 30, Cracow 30-059

Abstract

Waste minimization and recycling are principles of the concept of sustainable development that is now globally introduced. Construction in the sense of manufacturing goods and construction and exploitation of buildings generates a significant amount of waste. Therefore, the developing of the concept of waste management and the reverse logistics is implemented to the construction industry. A statement released by the European Commission on July 1, 2014, indicates, however, the presence of inefficient management of raw materials in construction. The primary purpose of initiatives published in the statement is to increase the efficiency of resource management by new and renovated buildings and also by the reduction of their overall impact on the environment that occurs in all phases of building life cycle. The main idea of the article is to define the concept of reverse logistics in relation to the construction industry and to analyze factors stimulating and conditioning the implementation of reverse logistics in construction projects, while giving the expected results. Physical flow of raw materials and products in the building life cycle has been analyzed. The article discusses the allocation of reverse logistics tasks among the participants of investment process, so that it has become an economically effective and profiting branch for construction companies along with a profitable environmental aspect. Problems that should be taken into consideration in order to manage the waste and raw material in construction in an effective way have also been indicated. As a conclusion, article shows an example of reverse logistics model, that may be the foundation for creating a decision making supporting system.

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* Corresponding author. Tel.: +48 12 617 47 67
E-mail address: sobotka@agh.edu.pl

1. Introduction

In many industries, such as automobile, electronic, automotive, reverse logistics (RL) has been successfully implemented and has become a strategic tool to reap the economic benefits. RL can also be a source of sustainable competitive advantage [1]. However, there are sectors of the economy including construction, where RL is still not implemented on a large scale, despite the social and environmental importance and potential benefits for entrepreneurs. The answer to the existing state of the inefficient management of raw materials in the construction industry in the EU is the European Commission's statement [2]. The primary purpose of initiatives is to increase the efficiency of waste management by new and renovated buildings and also by the reduction of their overall impact on the environment that occurs in all phases of the building life cycle [2]. There are many reasons to implement demands of the postulate. These include the protection of natural resources, waste reduction, energy consumption and CO₂ emission reduction, creating new jobs and more.

The research on issues connected with RL implementing in various economy sectors have been carried out. However, note that raw materials and construction products are characterized by a relatively long life cycle and logistic processes related to them are carried out by many participants, and backflows are most likely of a large size and asymmetric in relation to the original flows. Therefore, it is not possible to apply solutions directly from other industries.

Currently there are two names - reverse logistics (RL) and ecologistics (GL), which address the issue of product backflow, putting a different emphasis on the social, economic and environmental aspects. Those two are synonymous enough to cause problem in nomenclature in the area of consideration. Moreover, as indicated by Reza Hosseini [4], the lack of definition of the RL in construction is still noticeable. Therefore, the part of the publication is devoted to this issue. The article attempts to identify and analyze factors stimulating and conditioning the implementation of reverse logistics in constructions projects, giving the expected results. Physical flow of raw materials and products in the building life cycle has been analyzed. The article discusses the allocation of reverse logistics tasks among the participants of investment process, so that it has become an economically effective and profiting branch for construction companies along with a profitable environmental aspect. Problems, that should be taken into consideration in order to effectively manage the waste and raw material in construction, have also been indicated. As a conclusion, article shows an example of reverse logistics model, that may be the foundation for creating a decision making supporting system in terms of logistics, recovery, and during the renovation works.

2. General and construction definition

The first known description of the reverse logistics was developed by Lambert and Stock in 1981, and it is identical to the definition given by Murphy and Poist in 1986, defining RL as backflow of goods. In 1998, Stock defined RL as *"the role of logistics in product returns, source reduction, recycling, materials substitution, reuse of materials, waste disposal and refurbishing, repair, and remanufacturing"*. In the same year, Carter and Ellram described RL as *"the process whereby companies can become more environmentally efficient through recycling, reusing, and reducing the amount of materials used"* [5].

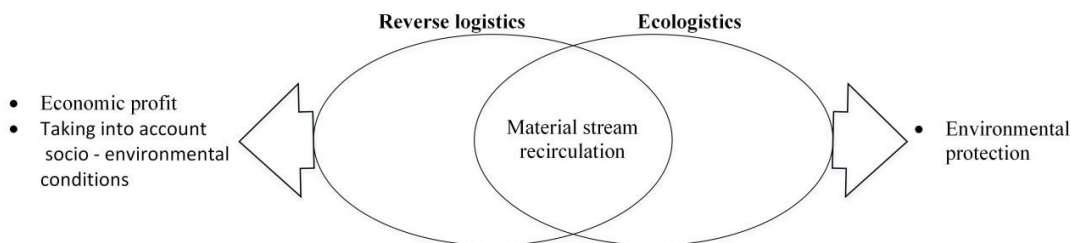


Fig. 1. The relation and orientation of LR and GL (own data)

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