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APPLICATION OF MULTI-CRITERIA DECISION-MAKING TOOL TO LOCATE CONSTRUCTION AND DEMOLITION WASTE (C&DW) RECYCLING FACILITIES IN A NORTHERN SPANISH REGION

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Abstract

Construction and demolition waste (C&DW) constitutes a priority waste stream in the European waste strategy due to its large volume and its high recycling and reuse potential. The increase in the C&DW generation experienced during the last decades has meant a driving force to more sustainable management options. In this way, specific legislation for this waste stream has been developed such as Directive 2008/98/EC which set a target of 70% of reuse, recycling and material recovery of the C&DW by 2020. In order to fulfill this recycling target, recycling facilities need to be properly located. Multicriteria Analysis (MCA) is a powerful tool frequently used in environmental decision-making problems which integrates the different points of view of the involved stakeholders.

In this work, a methodology based in Multicriteria Analysis with the aim of locating C&DW recycling facilities has been developed and applied to a real-life case in Cantabria, a northern Spanish region. The region has been divided in geographical areas in which different alternative locations for recycling facilities have been assessed. One of these geographical areas was evaluated and a compromise solution based on economic, environmental and social criteria has been provided by Definite 3.0 MCA software. Four multicriteria analysis methods: *Evamix* (EV), *Weighted Summation* (WS), *Electre II* (E2) and *Regime* (REG) have been performed in order to obtain the most suitable locations. Analyses of the sensitivity and uncertainty of the results have been also carried out in order to investigate the robustness of the solutions obtained. Therefore, the main findings of this research have showed the applicability of the proposed MCA-based methodology to select optimal locations of C&DW recycling facilities.

Key words: construction and demolition waste, decision making, facilities location, multicriteria analysis, strategic planning

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