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LIFE CYCLE ASSESSMENT OF THE PRODUCTION OF NATURAL AND RECYCLED AGGREGATES FOR CONCRETE: A CASE STUDY IN THE PROVINCE OF BRESCIA

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Abstract

The construction sector in Europe consumes about 50% of the total available raw materials, using enormous quantities of natural resources and soil from which these raw materials are extracted. At the same time, construction and demolition waste (CDW) accounts for about 35% of all waste produced both at the European and national levels, with approximately 60 million tonnes produced annually in Italy alone. The aim of this study, using the Life Cycle Assessment (LCA) methodology, was to analyse the environmental performance of the production process of recycled aggregates (RA) from CDW compared to natural aggregates (NA) for concrete production. In terms of overall environmental impact, the LCA highlighted that the production of recycled aggregates from construction and demolition waste has a significantly lower impact compared to the extraction of natural aggregates from quarries. The results of the LCA confirmed the importance and environmental advantages of using recycled aggregates in the construction sector, as they contribute to reducing the extraction of natural resources and the overall environmental impact of the production process. However, it is important to note that the actual assessment of environmental impact also depends on various specific factors of the case study, such as the technologies employed, transportation distances, and the management of CDW.

Key words: construction and demolition waste, life cycle assessment, natural aggregates, recycled aggregates

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