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"Gheorghe Asachi" Technical University of Iasi, Romania

LABOUR PRODUCTIVITY AS A MEANS FOR ASSESSING ENVIRONMENTAL IMPACT IN THE CONSTRUCTION INDUSTRY

Diego Calvetti[1]*, Miguel Gonçalves[1], Fabrício Vahl[2], Pedro Mêda[3], Hipólito de Sousa[1]

[1]CONSTRUCT/GEQUALTEC, Porto Univ. Faculty of Engineering, Dr.Roberto Frias 4200-465, Portugal
[2]Federal Institute of Education, Science and Technology of Santa Catarina, Av. Mauro Ramos, 950, 88020-300, Brazil
[3]Construction Institute, CONSTRUCT/GEQUALTEC, Porto Univ. Faculty of Engineering, Dr Roberto Frias 4200-465, Portugal

Abstract

Managing standards and environmental laws in the construction life cycle have become essential to constructors. In general, Life Cycle Assessment (LCA) methods quantifying environmental impact factors in the construction phase do not measure the impacts caused by the workers. This research introduces labour productivity as a possible LCA input-output factor, based on CO_2 emissions and generation of sanitary wastewater. The presented methodology aims to determine the environmental impact related with labour productivity, in a simple and agile way, for application in all types and sizes of construction projects. Through the application of this methodology, worked Labour-hour connects directly to the environmental impact. The findings evidence that craft workers who directly perform tasks on construction sites might potentially generate a higher volume of wastewater (nearly more 33%) and emit 1185% more CO_2 emissions than workers who perform only administrative activities. These values point that craft workers on duty/on-site exhale more CO_2 and discharge more wastewater than at home. Even though indirect workers may have similar emission levels while working or at home, their emissions assessment is relevant for construction industry LCA analyses. Beyond this, a case study evidence that developing countries with lower productivity may cause greater environmental damage than developed countries. In order to carry out the same task in less developed countries, a higher number of craft workers is necessary, which leads to a higher number of managers, increasing the staff office needed.

Keywords: environmental impact assessment, building, labour productivity, workers

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* Authors to whom all correspondence should be addressed: e-mail: diego.calvetti@prodyoup.com; Phone: +351 914714490