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Towards more sustainable social housing projects: recognizing the importance of using local resources

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Abstract

The social housing projects of Brazil are focused on providing shelter for families with low income and on reaching the ultimate objective of more sustainable development of the nation. The Brazilian program, in supporting these families, is carried out through three main standardized housing projects: popular housing (R1), popular building (PP4), and building for social interest (PIS). Decisions regarding the choice of one project instead of another are usually based on economic considerations, disregarding environmental issues important for achieving sustainable development. The main goal of this work is to assess which social housing projects should be promoted in each Brazilian state, aiming for higher sustainability. For this purpose, emergy accounting is used to quantify the environmental sustainability index (ESI*) and the emergy index for construction productivity (EICP, in m^2/sej). Results show the existence of different degrees of ESI* and EICP values among the three types of social housing projects, when considering the state in which projects are implemented. Analysis of the results identified the social housing projects that should be promoted to maximize ESI* and EICP aiming for higher sustainability. Choosing a project exclusively based on economic considerations could be premature, because it may forgo the opportunity to maximize sustainability of the national social housing program. This study also provides a scientific contribution to the emergy accounting method with regard to the scales of analysis that support the criteria used to count a resource as local or imported and in considering the partial renewabilities of resources according to regional characteristics.

Key words: Brazilian construction industry; Emergy; Social housing; Sustainable construction.

1. Introduction

When the demand for energy & material resources and the damage of gas emissions are considered over a buildings life cycle [1], the building construction sector causes the highest environmental load on the Earth. Therefore, documenting and controlling load from the building sector is one key to achieving sustainable development. Some numbers provided by the United

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