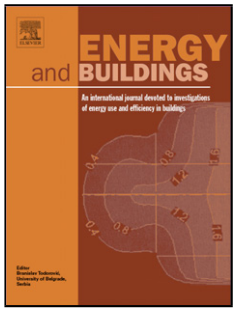

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jAnalyzing Sustainability in Low-Income Housing Projects using System Dynamics

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Highlights

- Assessing the Life Cycle Cost of a sustainable Low-income housing.
- Considering the dynamic nature and interactions among sustainability variables.
- Assessing of economic and environmental performances of sustainable building materials.

ABSTRACT

Low-Income Housing (LIH) projects have a vital role in developing countries as they serve a large sector of society; hence, they are considered one of the most important projects funded by governments. The total Life-Cycle Cost (LCC) of these projects is incurred during the use phase, making these projects lose its economic aspect of sustainability. Therefore, it is important to decrease the costs of such projects during their life cycle, taking into consideration the available resources. This paper focuses on two aspects of the sustainability of building through its life cycle; environmental and economic. For this purpose, the methodology considers reasonable costs that fit LIH projects using environmentally friendly materials. The methodology is based on assessing the LCC of LIH projects, taking into consideration initial cost and operation costs. The paper focuses on green-building materials with minimal cost, corresponding to the maximum number of points awarded under the Leadership in Energy and Environmental Design (LEED) rating system. This methodology is developed through the formulation of the System Dynamics (SD) model using a STELLA software package. The proposed model is capable of considering the dynamic nature and interactions among major variables affecting the assessment of economic and environmental performances of selected green materials. The proposed assessment methodology helps the decision makers in governmental housing

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