



Comparative Study of Conventional Ceilings in Iran from Environmental, Economical and Social Points of View

Maryam Deylami, Reza Maknoon, Nazanin Zare

1- Msc Student-Department of Civil and Environmental Engineering-Amirkabir University of Technology

2- Professor- Department of Civil and Environmental Engineering-Amirkabir University of Technology

3- Msc Student-Department of Civil and Environmental Engineering-Amirkabir University of Technology

m_deylami@aut.ac.ir

Abstract

Building construction is a growing industry in our country, Iran, and due to its environmental impacts it requires more accurate and careful policies. In this article, ceiling as an essential element of the building, has been studied from the environmental, economical and social perspectives. Environmental issues cover items such as global warming, acidification, fossil fuel depletion, etc. Acceptance of a ceiling, technically and the approval of engineers and contractors have been investigated as social issues. On the other hand we have studied the economical issues that have determining role in confirming a system. To achieve this purpose, we have chosen life cycle assessment (LCA) approach and the ceilings have been modeled in BEES (Building for Environmental and Economical Sustainability) software. This program can analyze the ceilings environmental and economical points of view simultaneously. A special questionnaire was prepared for asking the experts about technical and constructional aspects of the proposed ceilings. The results of these two different approaches were analyzed and finally it was found that some of the modern ceilings reduce the environmental burdens, and at the same time their construction are more simple, therefore this is worth paying attention in future policies for building industry.

Keywords: ceiling, life cycle assessment, environmental impacts.

1. INTRODUCTION

Building industry has consumed a large amount of natural resources such as energy, water and land, and released many kinds of pollutants to global or regional environment. [1] It also has many social and economical impacts. Therefore building industry has a great role in sustainable development in a society.

In Iran, special attention has been given to building construction due to fast population boost, natural disasters like flood and earthquake, and restoration of old buildings. However lack of planning and right policies, would induce severe problems for the society.

Ceiling as the principal element of a building, affect the cost, weight, materials consumption and duration of the construction. The objective of this study is to assess the environmental performance of four types of ceilings used in Iran building industry. In addition the environmental scores has been combined with economical and technical issues to obtain an appropriate model in order to help in decision making and adopting right policies, toward sustainable development.

2. Scope and methodology

The four types of ceilings that have been studied in this article are: 1) concrete block and joist, 2) clay block and joist, 3) EPS (expanded polystyrene) and joist and 4) Syak. The first three are conventional and the last one is a newly developed type of ceiling in Iran. The ceilings are shown in Figure 1 and 2.