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Modifying Buildings Life Cycle through Identifying Adaptive Reuse Criteria

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Abstract

Buildings have a great contribution in the consumption of energy and resources available on the planet earth. Given the importance of the sustainable development and the preservation of resources and lands for future generations, the idea of adaptive reuse of existing buildings is addressed globally. Adaptive reuse of the existing buildings is an approach to restore the life of buildings at the end of their useful and service life, by determining a suitable use based on their potential and characteristics. Adaptive reuse of existing buildings through maximum use of building material, social, cultural, structural and physical potential, avoid of unnecessary extension of cities and use of lands and resources, is well align with sustainable development main goals. But, despite all the benefits and advantages of adaptive reuse, there are cases that adaptive reuse is not suitable and demolition is inevitable. Therefore we need some criteria to evaluate buildings potential for adaptive reuse. For buildings which have a high potential for adaptive reuse, we also need some criteria to determine a (re)use in compliance with the existing building features. By determining such criteria, it is possible to modify the life cycle of buildings through adaptive reuse. Based on such a perspective, the authors investigated the literature and scholars view points and criteria which are addressed in different scientific documents. The literature shows a confusing variety of criteria. Through this study the adaptive reuse related criteria are identified and by an analytical approach and according to similarity between these criteria, they are classified in two areas. The first area includes the criteria in concern to examine existing buildings adaptive reuse potential. The authors identified eight comprehensive criteria for this area. The second area includes the criteria related to the determining a match reuse for existing buildings. The authors identified six comprehensive criteria for this area. The presented comprehensive criteria, covering all criteria in the literature, can be considered as a new framework and foundation for future studies on existing buildings adaptive reuse. In this way this study will contribute in buildings sustainability. According to presented criteria, buildings life cycle is modified. The traditional buildings life cycle include these phases: design, construction, operation, maintenance, demolition and new construction. It should be noted that such an approach to the buildings life is a linear approach, while regarding the increasing importance of sustainable development, attempt to restore buildings into the life cycle is a more acceptable approach. According to this, after the end of buildings useful life and before the demolition, buildings potential for adaptive reuse should be considered according to the related criteria and only when a building dos not have a good potential for adaptive reuse, it can be demolished. This approach will extend buildings life span and can lead to avoid of premature demolition. Premature demolition of buildings has many disadvantages. Of the disadvantages of this approach are wastes production, waste of buildings' embodied energy, unnecessary use of resources and materials. Therefore the proposed buildings life cycle can leads to a more sustainable environment.

Keyword: adaptive reuse, demolition, building life cycle, Sustainable development, existing buildings.

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