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Human Factors in Design of Sustainable Buildings

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ABSTRACT

Ergonomic approach is aimed at optimizing human interactions with systems, in order to make human activities more efficient, safe, comfortable and satisfying. Built environment influences people's everyday life because all human activities are executed in a built space. In this framework, architectural design can be enhanced by the consideration of human factors perspective, because it gives the cultural and practical references to envisage how technical solutions can fit the environmental needs derived from people's life and work activities they perform. Since the main objectives of sustainable design are to reduce, or completely avoid, depletion of critical natural resources and raw materials; prevent environmental degradation caused by facilities and infrastructure throughout their life cycle; create built environments that are livable, comfortable, safe, and productive, a broader consideration of the role of human factor has to be taken into account to enhance design process of sustainable buildings. Several studies evidence that to reach sustainable goals of buildings, particularly referred to energy and resources use and optimization, unexpected disadvantages for final users may occur. The paper shows recurring human side effects of building solutions and elements mainly adopted to address green strategy and technologies, in order to support building design to create working and living spaces actually fitting, in the same time, sustainable performance of buildings and needs of inhabitants.

Keywords: Building usability, Green Building Rating Systems, End-users

INTRODUCTION

It is generally accepted that sustainable development calls for a convergence between the three pillars of economic development, social equity and environmental protection (Drexhage and Murphy, 2010). As we know the concept was first introduced by Brundtland (UN,1987), who defines development as "sustainable" when it "meets the needs of the present without compromising the ability of future generations to meet their own needs". It considers a long term perspectives of the socio-economic system, to ensure that improvements occurring in the short term will not be detrimental to the future status or development potential of the system. Such kind of development implies minimizing the use of exhaustible resources, or at least, ensuring that revenues obtained from them are used to create a constant flow of income across generations, making an appropriate use of renewable resources (Bellù, 2011). Human organizations must act aiming at the same time at: the effective protection of the environment; the prudent use of natural resources; the social progress which recognizes the needs of everyone; the maintenance of high and stable levels of economic growth employment.

Literature shows sustainability has become today almost one of the main concern in human factors studies (Martin *et*