TOWARDS SUSTAINABLE ARCHITECTURE:
THE RELEVANCE OF DESIGN IN EVALUATION METHODS.

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INTRODUCTION

In the last decade, a number of valuable initiatives for promoting sustainable architecture have been developed, based on the need for explicit and replicable evaluation methods. These initiative raise a number of issues at different scales and stages of project development, from urban design to construction specifications, and encompassing themes ranging from global warming concerns to local impacts on occupants [1]. The methods also reflect the evolving issues of energy, health and global sustainability.

These efforts have not yet attracted adequate attention from architects, urban designers and planners. The lack of commitment from the producers of the built environment should be tackled within their own fields of interest, practising skills and relevance to spatial dimensions. A widening gap between designers and scientists developing evaluation methods is increasingly evident and a factor of concern.

Stress on life-time efficiency and operational costs, essential issues in sustainability, are often of little concern in project development.

Interaction of building and context, analysing environmental influences at the micro urban scale, is another key area for evaluation.

Especial efforts should be paid therefore to study how design issues can be successfully integrated into the evaluation methods.

PRESENTATION

Although the quality of architectural design is undoubtedly related to each of these issues, themes and focuses, the difficulty of evaluating the implications of design decisions in the built environment and in specific buildings is still very considerable [2]. The risk of segregate design issues under the consideration of being subjective and 'aesthetic' may also contribute to increase the gap between designers and scientists within the process of introducing and developing evaluation methods in current practice. Some of the design aspects affecting 'sustainability' may be overlooked and underdeveloped in existing evaluation methods and procedures.

The use of these procedures and attempts to apply them in the specific local situation of Buenos Aires give rise to the following reflections:

Globalisation: The globalisation process of technology and design may ignore specific local cultural and geographic requirements. There is also an increased danger that the superficial image of well-publicised 'green buildings' from a different context is copied rather than the substance behind the physical appearance.

Climate: Methods for building evaluation, which have been prepared primarily in developed countries as a result of climate change and CO₂ emissions concern, should be evaluated and adjusted before implementation in different environmental context found in hot and warm climates.
Development: Regions with hot dry and warm humid climates are also related to the 'under develop belt' of the tropics; therefore attention should be paid to differing and specific comfort requirements and life styles together with the internationalisation of technology and spatial configurations. Changing patterns in behaviour constitute a 'moving target' in the performance of the built environment, where market forces strongly influence social expectations and user demands. The trend supporting these factors leads to the adoption of certain building typologies, related to demonstrating status and following patterns of consumption. These parameters will then affect the factors to be included and the balance required in the evaluation process to achieve improved levels of sustainability.

Change: The rapid evolution of focuses and dimensions of 'greenness' has produced significant variations in the structure and content of evaluation procedures over the last years, not always following architectural fashions, which are also changing fast. Therefore, evaluation methods should recognise that the targets are moving and changing over time, while what is targeted is also in the process of definition.

SPECIFIC FACTORS
The following specific factors exemplify the general reflections mentioned in the previous section:

Bioclimatic design: The relevance of bioclimatic design strategies for natural conditioning of buildings may have a different emphasis in subtropical climates where the energy demand can be reduced to very low levels with appropriate design. The criteria for evaluation of the building's response to climate may be the subjective thermal quality rather than the control of energy consumption. Nicol [3] has shown that thermal comfort preferences in warm climates vary from air conditioned buildings to natural conditioned buildings.

Embodied energy: In naturally conditioned buildings with low energy use over the life of the building, the environmental impact of the embodied energy may be proportionally more important than in the colder climates of the developed world.

Outdoor space: The microclimatic quality and design of usable outdoor space is of greater importance in climates where conditions in these spaces are closer to comfort levels. Outdoor and intermediate spaces in traditional housing of warmer climates, such as patios, verandas, loggias, etc., provide additional living area. With simple elements such as shade trees and pergolas, etc., usable space of very low impact and adequate comfort levels can be created. On the other hand, in cold climates, outdoor space has different intensity of use and levels of benefits for the occupants.

Sustainable materials: The traditional materials used in the developing world were by their very nature more sustainable than most modern materials. Renewable or very widely available raw materials were used without elaborate or energy consuming processes, though frequent labour intensive maintenance was required. Modern materials often imply greater environmental impact, without necessarily assuring better environmental quality. This raises the problems of comparing and assessing different types of variables [4].

Development and dependency: In first world countries, the origin of raw materials, the industrial processes, transportation and the technology used in the production of the built environment can be evaluated in terms of embodied energy, environmental impact of production and impact on internal air quality, etc. It can be argued that, in the context of regions under different development stages, promotion of local employment, reduction of technological and economic dependence, etc., are also vital to promote 'sustainable development'. It is also important to estimate...
the dependence of future generations to support excessive operating and maintenance costs due to building inadequacy or short lifetime cycles.

**DESIGN FACTORS**

In both developing and developed countries, the design quality of buildings, though difficult to evaluate, may have a vital impact on 'effective sustainability'. Functional relationships and the external appearance of buildings can have a profound influence on the users, affecting the sense of belonging and the consequent social behaviour.

Many large-scale housing projects around the world, with carefully developed designs and well planned social programmes, have experienced catastrophic both social and construction problems that have required major renovation, redevelopment, partial or even total demolition before the planned lifetime of the buildings have been reached.

The globalisation of design at different scales is running fast and the fragmentation of the urban tissue seen in many developing regions shows its impact due to the increasing number of free standing high rise buildings, not only in central areas but also in new developments and small towns. This pattern, resulting from design alterations, is producing considerable changes in the urban environment, affecting building quality with immediate and long time effects [5]. This is another example of the need to qualify and quantify design decisions.

**CONCLUSIONS**

There are general and specific factors found in less developed countries that require adjustments to the evaluation system, both in the variables included (or excluded) and the relative values of each variable.

The explicit incorporation of design factors and variables, though complex and often implying more subjective evaluation criteria can help to bridge the gap between environmental evaluation and guidance for the designer.

Evaluation of buildings, as a new discipline in the production of the built environment, may also contribute to modify decision making within the design process.

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**REFERENCES**