

Feasibility of Environmentally sustainable buildings in State of Qatar

Qatar

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The world has witnessed incalculable technological achievements, population growth and corresponding increases in resource use since the industrial revolution; the side effects of those activities were recognized as we entered the new century. As world population continues to expand, implementation of resource-efficient measures in all areas of human activity is imperative.

The purpose of this research is to examine the history of sustainable building, main factors and categories. Various green building rating systems, their components, scoring system and main categories were discussed and a comparison between LEED rating system and QSAS "Qatar Sustainable Assessment system" was conducted.

Environmental Impact Assessment (EIA) is a fundamental tool to ensure that decision makers consider the ensuing environmental impacts when deciding whether to proceed with a project; EIA was summarized and implemented on a case study. The research also examined the feasibility of environmentally sustainable buildings throughout evaluating the cost savings related to main components (Construction, life time and environmental) costs. The prime rule for this research is to discuss environmental impacts, mitigation measures and cost implications of using green building in the Gulf Area, using Qatar as a model throughout examining QSAS "Qatar Sustainable Assessment system" and highlighting whether or not sustainable building techniques provide a real contribution to the society, environment and economy.

A case study was established to verify the theoretical assumptions and to show how QSAS tools are used. It was found that the financial benefits of green building include lower energy, waste, and water costs; lower environmental and emissions costs; lower operation and maintenance costs and savings from increased productivity and health are highly effective in the Gulf Area. Also some improvements were recommended for the rating system used in the case study.

Conclusion:

The financial benefits of green buildings of energy, waste & water savings and emissions reductions should be viewed as fairly precise, reasonably conservative estimates of direct benefits that alone significantly exceed the marginal cost of green building. Health and productivity benefits may be viewed as reasonably conservative estimates within a large range of uncertainty

Constructing green buildings cost-effectively requires integrated green building design and a careful commissioning process. The commonly higher initial cost of green design and

DOI: 10.5339/qproc.2015.qgbc.42

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construction can be expected to drop as designers and builders gain experience in building green.

According to the QSAS, certification is denied for a score less than (0) and could be achieved for any score above this number which, after examining the case study, could be easily granted even if the project is not adding any value to the community throughout the three main sustainability pillars. Additional classifications could be imposed to the QSAS scoring system in order to motivate projects' stakeholders to achieve a higher rating within the established system.

Modifications proposed for the QSAS rating system could be summarized as follows:

Score	Certification level	QSAS certification	Proposed modifications
$X < 0$	-	Certification denied	Certification denied
$0.0 \leq X \leq 0.5$	*	Certification achieved	Fair
$0.5 \leq X \leq 1.0$	**		
$1.0 \leq X \leq 1.5$	***		
$1.5 \leq X \leq 2.0$	****	Certification achieved	Good
$2.0 \leq X \leq 2.5$	*****		
$2.5 \leq X \leq 3.0$	*****		

Table 38 QSAS Modified Certification Levels

The proposed modification could have a direct reflect on the financial aid provided from the state of Qatar to facilities and insurance fees required from the facility. According to this concept the aid and insurance could be categorized according to the level of complying with QSAS certification level.