



Barrier to Green Building Construction on Long Island, NY – A lesson Learn From A senior Project Assignment

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Introduction

Sustainability has been broadly defined as a development that meets the needs of the present without compromising the ability of future generations to meet their own needs¹. Green or sustainable building practices create structures and use processes that are environmentally responsible and resource-efficient throughout the buildings existence that includes design, construction, operation, maintenance, renovation and deconstruction. All components of sustainable building undergo life-cycle assessment (LCA), which is an analysis of the environmental aspects and potential impacts associated with a product, process or service. This evaluation process can assist in deciding among alternative building investments by comparing all of the significant differential costs of ownership over a given time period in equivalent dollars. This ensures that all the components in green buildings are in fact sustainable, environmentally friendly and cost effective².

The Long Island region of New York State is located east of New York City. It is about one hundred miles long and on average about twenty five miles wide on a highly developed piece of land. Leadership in Energy and Environmental Design (LEED) buildings under the U.S. Green Building Council (USGBC) are largest name in sustainable design worldwide. However, statistics show Long Island is lacking in LEED certified buildings as well as other sustainable buildings and energy conservation programs. According to USGBC New York State is ranked third in U.S with 2570 LEED registered and certified buildings and New York City ranked first among cities with 909 registered buildings⁵. However out of 663 registered LEED buildings for New York State, Long Island region accounts for only 12.5 percent of those buildings. As part of the Senior Project course in the Construction Management Program at Farmingdale State College, a group of students and the faculty member wanted to find out the reasons for this lack of motivation among designers and constructors in Long Island. This paper describes the results and the process of this study.

Background

Conventional building practices have proven to be detrimental to the environment. The construction industry is one of the largest industries in the United States, consistently employing about 5.5 million workers and accounting for roughly eight percent of the gross domestic product. Because development and construction practices have a great impact on not only the national economy but the environment as well, greater attention has been paid to resource allocations and efficiency as well as education pertaining to factors that can mitigate these implications. According to USGBC, conventional building practices have the following effects that could have severe negative implication for the future generations: produce a third of total carbon dioxide emissions, generate 136 million tons of waste per year in the U.S. during construction, operation, demolition processes, accounts for 60 percent of all the raw materials

used in the U.S., consumes 37 percent of total energy consumption, have increased transportation demand, and created urban sprawl³. Sustainable design helps to mitigate these issues with both direct and indirect approaches. Sustainable design makes the design and construction a collaborative and comprehensive practice rather than a form of a production line. For example, to mitigate excessive energy usage and greenhouse gas emissions, the direct approach would be to examine the use of different energy sources such as wind, solar, or natural gas. An indirect approach addresses a secondary form of corrective action, acknowledging elements like the importance of building orientation, window placement and use higher grade insulation.

Coastal Zones, such as Long Island, are particularly vulnerable to climate variability and change. Rising sea levels can inundate coastal zones, erode its beaches, cause flooding, and increase salt levels of rivers, bays, and groundwater tables. In the last decade the demand for energy increased about 20 percent in Long Island and is expected to increase at a rate of about 2 percent per year. The average carbon footprint in this area is 24 tons per person which is about 4.4 times higher than the global average⁶.

Objective

The objective of this paper is to explore the extent sustainable practices are used in Long Island and obstacle and opportunity exist for such practices for the industry.

Methodology

A survey of 15 questions was designed and programmed into an online survey instrument. The online survey generator that we found most compatible for our needs was Stellar Survey. Here we were able to organize our questions by category and generate the responses to follow a format we needed (i.e. allowing more than one option to be selected per question and so on). Our first step was to meet with industry and educational professionals to discuss the types of questions we need to have for our objective. The survey acted as an instrument as an electronic interview. Attached to the email was a cover letter that informed the potential participants the purpose of the study, approximate time needed to complete the survey, and assurance of personal confidentiality. A hyperlink to the survey was provided at the bottom of the letter directing the respondent to the website containing the questionnaire. The population included architects, engineers, contractors, consultants, and developers. The resource pool was created through personal contacts, college's industrial advisory committee members, local USGBC website, and the phone books. The email request to complete the survey was sent to 163 potential participants. The first section of the questionnaire was developed to obtain information regarding characteristics of the respondent. These included location, profession, knowledge, experience and sources of education regarding sustainable practice. The second part of the survey focused on how efficiently and effectively sustainable design practices were implemented for projects in Long Island. It also addressed barriers and incentives for such practices, the extent that LEED has motivated them for such practice, and the nature of such projects they completed.

Findings

The response rate for the survey was 36.78 percent. All but one were located on Long Island. The participant located in the New York Metropolitan area completed projects on Long Island.

Among the respondents, 35.7 % were architects, 28.6% were engineers, 14.3% were contractors and 21.4% were under others that included project managers, A/E firms, and vendors.

71.40% indicated they were very familiar with sustainable practices and 28.60% (fig. 1) indicated they were somewhat familiar with it. However, 31.70% mentioned the main source of their sustainability knowledge came from personal research whereas only 14.60% came from the company training. Prior education counted for 14.60%, voluntary educational workshops counted for 26.8%, and 9.8% came from the clients and 2.4% from other sources. 78.60% indicated they were involved in sustainable projects within the last 5 years.

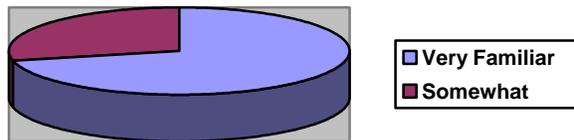


Fig. 1. Sample Population's Exposure to Green Buildings

Respondents were given a choice of “all that apply” option for the question how much do the certain factors influence the development of sustainable building projects in their company. 45.5% indicated media somewhat influence their decision, 30.80% indicated economic incentives, 21.40% indicated client demands, 28.60% indicated society has somewhat influence on their decision to do sustainable projects.

In another “all that apply” category, 27.30% respondent indicated financial reward would encourage the company to participate in sustainable building projects. Whereas 20.50% respondents indicated stricter building code will encourage them to do so. 15.90% indicated builder/developer recognition will be the reason to engage in sustainable projects. 13.60% indicated better sustainable design guidelines will encourage them to be more involved in sustainable projects.

85.70% mentioned participation in LEED projects as part of sustainable practices. It gave a clear idea that LEED is the most popular/recognizable sustainable practices in this region. 64.30% respondents also indicated sustainable projects were public projects.

In another multi choice category on how much certain factors hindered sustainable building practice, 83.30% respondents indicated recovery of long term savings do not reflect in upfront costs. 58.30% indicated sustainable practices are too expensive, 38.50% mentioned lack of technical knowledge on the part of others within the project team hinders regularly incorporating sustainable design practices. 35.70% indicated lack of training for such hinder. 23.10% indicated lack of interest of clients as an obstacle for sustainable projects. 25% indicated lack of sustainable material suppliers. 20% respondents indicated lack of understanding among crafts

regarding sustainable practices, 18.20% indicated insurance/liability problems with offering warranty on non-standard materials and methods.

64.30% respondents felt sustainable design movement is very relevant to today's society. 28.80% respondents thought it is somewhat relevant, but 7.10% (fig.2.) respondents indicated it is barely relevant to today's society.

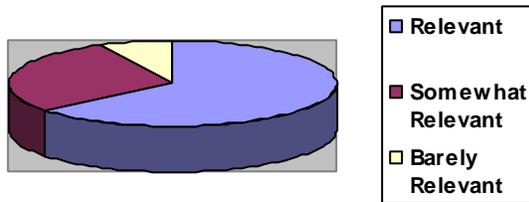


Fig 2. Relevancy of Green Buildings Among Sample Population

Comments on Findings

One of the goals of this survey was to reach out to a variety of construction industry professionals to determine what motivates and/or prevents them to practice recognized sustainable concepts to their projects. All the respondents are either very aware or at least somewhat aware of the concepts and methods of sustainable practice. However, a vast majority said their knowledge of sustainable practices has been through personal research or voluntary workshop attendance. Although these professionals are aware of sustainable design practices they were not convinced that the benefits outweigh the cost. Also, there are only a limited number of LEED projects on Long Island. But most of the respondents are familiar with LEED process and it is the most recognizable sustainable practices in this region. Many respondents indicated sustainable practices are too expensive and there are not enough financial incentives to engage in such projects. It is our belief that the professionals surveyed are not usually involved in Life Cycle Assessment or Costing of the projects and do not see the return on investment in long term or in terms of societal context.

Conclusions and Recommendations

Throughout our study and exploration into our survey responses, we found that lack of a cohesive program is what Long Island's greatest barrier to the progress of sustainable practices. Currently municipality incentive programs or regulations that have been implemented have shown a positive impact. The first step in motivating sustainable design in Long Island is to implement a new regional minimum standard. As we understood, this is one of the leading motivators among private projects. Along with employing these regulatory requirements, incentive programs should be established to encourage construction professionals to embrace sustainable practices. Followings are our recommendations for incentive programs that could benefit the region.

Structural Incentives: Many design professionals claim that permitting process is too time consuming and not cost sensitive. In some cases the permitting and reviewing process can take months or even years resulting in increased project cost and delay on returns. If there is a preferential treatment for verifiable sustainable buildings, owners and developers will be encouraged to build sustainable buildings in spite of relatively higher initial cost. This incentive could be implemented by the municipalities at no or low cost.

Economic Incentives: This incentive could be implemented in a variety of ways depending on the goals and capability of the municipality. Fee reduction or fee waiver program could work with or without structural incentive. For those municipalities that may not have capability of expediting permit processing, fee waiver or reduction could encourage some owners/developers to follow sustainable practice. Tax Credits and Abatement- New York State tax credit program was intended to encourage owners and developers to design, construct and operate buildings that are energy efficient, utilize recycled materials, incorporate renewable and energy efficient power generation is quite effective at the state level⁴. Long Island municipalities could adopt some version of the program. Tax abatements work by exempting property owners from paying local taxes for a period of time. Revolving Loan Funds – revolving loan funds allocate low interest loans from a large fund to those seeking to build or renovate verifiable sustainable buildings. Savings from utility cost help the owners repay the loan without an additional burden for any extra upfront cost used for sustainable buildings. At least two of the municipalities in Long Island now started limited programs based on this principle.

Educational Programs: One of the other barriers mentioned often is lack of understanding of sustainable practices at various levels. First, general public understanding of long term benefit of sustainable practices is crucial to broaden acceptance of such practice. Free public seminars/workshops needed to be organized by the municipalities, public libraries, and educational institutes. Educating building owners or potential owners responsibilities should rest on these entities also, further local builders organization should be engaged in such education efforts. More technical education for various levels of participants could be the responsibility of the local professional societies, trade organizations, and local higher educational organizations. This give us enough encouragement for introducing green building concepts throughout the curriculum

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