

International Conference on Applied Economics (ICOAE) 2013

Sustainability components affecting decisions for green building projects

K.I. Vatalis^a, O. Manoliadis^b, G. Charalampides^a, S. Platias^a, S. Savvidis^a

^aTechnological Educational Institution of Western Macedonia Greece

Dept. of Geotechnology and Environmental Engineering Koila Kozani 50100.

^bDemokritus University of Thrace, Department of Civil Engineering, Xanthi Greece.

Abstract

Construction process is the broad mechanism for the realization of human settlements and the creation of infrastructure that supports development. This includes the extraction and beneficiation of raw materials, the manufacturing of construction materials and components, the construction project cycle from feasibility to deconstruction, and the management and operation of the built environment. In Greece, the complex problems shared by cities are evidence of the impacts of urban sprawl. This research aims to investigate the sustainability components affecting decisions for green building projects. The research method is based on a questionnaire survey of thirty two participants who asked to assess nine sustainability components namely: Life cycle assessment, energy efficiency and renewable energy, water efficiency, environmentally preferable building materials and specifications, waste reduction, toxics reduction, indoor air quality, smart growth and sustainable development and environmentally innovative projects, which affect the decisions for green building projects. The respondent results indicate how participants prioritized the sustainability components ensuring a better quality of life inside buildings based on the principals of “green” buildings economy. Energy efficiency and renewable energy is considered of high priority followed by the reduction of toxic materials, indoor pollution and water saving.

© 2013 The Authors. Published by Elsevier B.V. Open access under [CC BY-NC-ND license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

Selection and/or peer-review under responsibility of the Organising Committee of ICOAE 2013

Keywords: sustainability, green building projects, Life cycle assessment

1. Introduction

The Earth’s ecosystems today are at a critical point. Human activities currently lead to irreversible losses of important ecosystem functions. Buildings and construction works have the largest single share in global resource use and pollution emission. In OECD countries the built environment is responsible for around 25-40% of total energy use, 30% of raw material use, 30-40% of global greenhouse gas emissions and

for 30 to 40% of solid waste generation. In addition, in OECD countries, people spend almost 90% of their life inside buildings. In the United States, the annual cost of building-related sickness is estimated to be at 58 billion \$. Consequently, healthy and comfortable indoor environments contribute significantly to human health and well-being and offer a large potential for reducing “external” costs to societies through lowering diseases (Chwieduk, 2002).

Construction process is the broad mechanism for the realization of human settlements and the creation of infrastructure that supports development. This includes the extraction and beneficiation of raw materials, the manufacturing of construction materials and components, the construction project cycle from feasibility to deconstruction, and the management and operation of the built environment (UNEP agenda 21, 1992).

Green construction refers to a structure and using process that is environmentally responsible and resource efficient throughout a building's life-cycle: from siting to design, construction, operation, maintenance, renovation, and demolition. Although new technologies are constantly being developed to complement current practices in creating sustainability structures, the common objective is that green buildings are designed to reduce the overall impact of the built environment on human health and the natural environment.

US-EPA considers several projects types for sustainable construction. The projects must demonstrate at least a 20% savings in energy, an increase in water efficiency, or utilize green storm water practices that demonstrate new or innovative approaches to sustainable water management. This requires close cooperation of the design team, the architects, the engineers, and the client at all project stages. The Green Building practice expands and complements the classical building design concerns of economy, utility, durability, and comfort.

As far as the legislative framework is concerned the European Directive 2002/91/EC, includes the energy performance of buildings directive, which refers to the environmental information in energy certificates, particularly CO₂ emissions. Environmental performance is a major driving force for energy saving (climate change, exhaustion of resources, nuclear waste, toxicity aspects, etc.). Reducing environmental impact in the building sector requires appropriate evaluation methods (Jönsson, Å. 2000) allowing the following: i) Environmental performance levels to be integrated into programmers (clients' brief) by the authorities (e.g. requirements in municipal policy and building programs), ii) Advice to be provided to designers, architects and consultants, in order to reach such targets, iii) Guidance for efficient operation and management of buildings, so that actual performance corresponds to design performance, iv) Methods and tools to evaluate the most cost effective measures (actions) for energy savings and reduced environmental impact over the whole life cycle (Jönsson, Å. 2000).

In Greece, the complex problems shared by cities are evidence of the impacts of urban sprawl: increasing traffic congestion and commuting times, air pollution, inefficient energy consumption, loss of open space and habitat, non-optimal allocation of economic resources and the loss of a sense of community. These combined pressures, along with the challenges faced specifically by stakeholders of the built environment, have led to a growing awareness of the need for change. In response to these pressures the green projects are beginning to permeate the Greece construction industry as a possible strategy to meet the needs of clients and contractors while ensuring business success in an increasingly competitive and constrained operational environment (Vatalis et al., 2011).

Going towards green building projects in Greece a questionnaire survey was used in order to investigate the preferences of clients, brokers, contractors, engineers and construction companies concerning the real interest about the evolution of green building projects. Main purpose of this research is to estimate the overall level of interest for green building projects in Greece including how adoption varies by sustainable characteristics of the project, as well as the importance of weighted green components which affects the decision of participants in an environmental perspective.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات