

FINANCIAL CONSIDERATIONS FOR SUSTAINABLE CONSTRUCTION PRACTICES

Introduction



Figure 1: Balancing Act in Considering Finances [1]

Financial Considerations are arguably one of the biggest deterrents from sustainable construction practices in today's day and age. Almost all aspects about building sustainably tend to cost more, making financial considerations a popular topic and focus of sustainability plans. The approach taken in examining the economic portion of sustainable building projects has changed with the government's involvement in using economics as a motivator to encourage development.

For a visual of the balancing act, see Figure 1^[1].

Historical Background

When considering the effectiveness of all building projects in the past that were actively pursuing sustainability, financial cost has continuously come up as one of the largest hindrance to green building^[2]. In fact, a case study performed by Lam et. al. indicated that the top three most agreed upon crucial barriers against green building techniques over standard techniques are additional cost, delay in construction time, and limited availability of reliable suppliers^[3]. All three of these barriers can quite easily be boiled down to having an economic impact on the project, showing the true threat that financial considerations can pose to the acceptance of sustainable construction practices.

In order to gain a better understanding of what all is involved in green building considerations, life cycle studies have often been conducted on projects. Life Cycle Assessment is a way of evaluating alternative product systems' environmental performance, where Life Cycle Cost (LCC) analyses alternative investments' business decisions' cost effectiveness^[4]. The further defining over time of what LCC entails has had a major impact on economic consideration: LCC goes beyond the initial overhead cost to include paybacks through the lifecycle, including energy saving payback periods, externalized environmental costs in current building technologies, and governmental stimulus of sustainable projects^[5]. When people have historically only considered initial cost and maybe a slight bit of lifecycle payback, they saw a much bigger sticker price than the present view that values the environmental and social costs in as part of the economic costs. The economic portion of sustainability is much more multifaceted than originally viewed, and with this change of mindset has come advancements in the economics of projects.

Roll in Sustainability

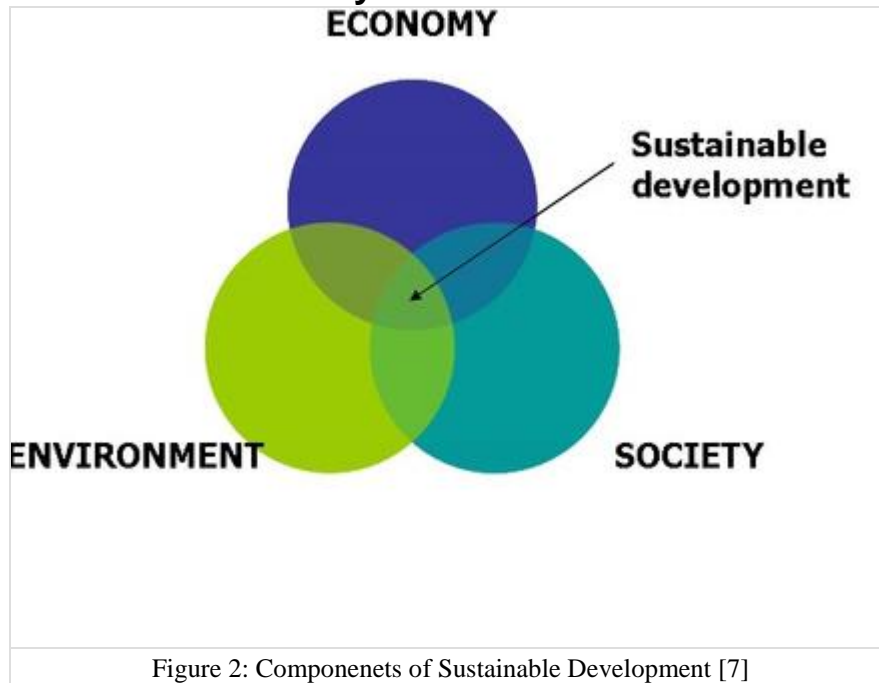


Figure 2: Componentes of Sustainable Development [7]

Lam et. al. notes that the biggest factor in deciding if a project pursues sustainability or not is whether project selection criterion is based off the "most economical advantage" model or the "most advantageous [as a whole]" mode^[6]. Considering economic portions by themselves rarely lead to pursuing a sustainable design, whereas considering only environmental and societal factors usually result in a very expensive project. As shown in figure 2, the economic, societal, and environmental portions of sustainable development are all intertwined^[7]. If each element is considered completely by itself, the extremes cannot be made to mesh, but if each is considered in respect to its accompanying criterion, a truly sustainable end result can be achieved. Economic Profitability Objectives should be set that encourage social and environmental aspects of sustainability^[8]. These allow a more effective integration of the three aspects of sustainability, balancing the financial considerations rather than ignoring or over-emphasizing the economic portion of a project.

Variations

Economic considerations today can be narrowed down to three main categories: lifecycle payback due to energy savings, cost offset due to governmental economic incentives, and direct governmental mandate regulation^[9].

- The lifecycle payback can simply be understood with a net present value consideration of greater initial expenses being counteracted with decreased incremental spending. How long will it take for a greater initial cost to pay for itself in savings (energy, maintenance, or otherwise)?
- The governmental economic incentive category has begun to be widely used on the private sector, where individuals are encouraged to "go green" in house construction or remodeling by being provided a financially attractive award to sustainably built houses^[10]. The government creates the voluntary financial attraction in a variety of ways, including indirect methods such as creating tax cuts for investments spent on efficiency upgrades or direct methods such as providing direct subsidies used to cover the costs upfront^[11].

- The governmental mandate regulation is increasingly being used in the public sector to encourage sustainable development by regulating what is accepted as sustainable and making the public sector comply with the set regulations; although based off regulation this method often utilizes finances as leverage^[12]. Businesses and agencies seeking funding can easily be persuaded to build in a more expensive yet economically and socially adequate structure if they are awarded funding for doing so. On the flip side, funding may not be given out if compliance with green policies are not met.

Large debates currently exist over whether or not the private sector should be subjected to top-down restrictive regulation as the public sector has been. Cicero brings many "important theoretical, policy, and empirical issues" to light concerning regulation of the private sector. Questions and positions arise such as "Why should government fund subsidies to encourage private investors to go green?", "Should the government use incentives and other means to push a green agenda?", and "How do we determine if an incentive is truly beneficial to its purpose of sustainability?"^[13] In considering whether the private sector should be regulated on the sustainability of their homes, it is important to remember that green building proposals are currently rather unsuited to become building codes as they are goals and guidelines as opposed to hard-set, objective standards^[14]. Once green building techniques have been around long enough to develop standards, it may be advantageous to regulate the private sector, but until then it is important to encourage sustainability while working on further classifying and scrutinizing building technique advancements to separate the truly sustainable from the overly financially, overly environmentally, or overly societal focused.

Applications

How economic considerations relates to/ can be applied to construction applications. (maybe this is covered well enough in other sections?)

With expense typically being the main resistant force for sustainable projects, tactics to bring the financial aspects of projects into balance have to be well approached for projects in the future. Improved marketing, standardization of green clauses, and increased experience should all help make otherwise sustainable projects more economically feasible^[15].

- Improved Marketing: Being able to advertise and convince others to consider environmentally or socially sustainable products can successfully help sales. This marketing can either reveal that the economics of the product are much better than assumed, or emphasize that the other sustainable aspects of the product makes it worth it to spend extra money.
- Standardization of Green Clauses: Making definitions and expectations universal nationwide makes it much easier and attractive to pursue. If every organization, state, or district has their own expectations for what qualifies as green building, it is economically challenging to keep up with the short-reaching standards. Standardized green clauses help greatly in allowing the general populous to take advantage of the standardized sustainable technology.
- Increased Experience: Engineers, contractors, and architects all have an easier time adapting known technology to specific structures rather than having to re-invent the wheel every time. As experience in building sustainable structures increases, the labor required throughout the project should be less, yielding a more economically competitive final product.

Examples of Financial Considerations of Sustainability in Action

Modular construction and prefabrication are two examples of process that have been established as sustainable due to being economically beneficial^[16]. These methods of construction make more efficient use of materials, labor, and design. Such mass production makes the units created much more economically feasible. Waste material reduction makes the products more environmentally friendly. However, the social acceptance of modular construction for housing is harder to obtain as mass

uniformity is not viewed highly. These structures have been deemed sustainable, however, as the economic savings sways people to accept the final product regardless of the negative attitudes toward mass uniformity. Financial considerations have been the main driving force that makes modular construction and prefabrication considered a sustainable building method.

Solar panels and photovoltaics are an example of constructed items that have been deemed sustainable regardless of financial considerations^[17]. Solar panels have been deemed to be environmentally sustainable as they turn sunlight into electrical energy rather than relying on fossil fuels. Marketing has been successful enough that the general population views them as socially acceptable. However, the initial cost is quite extensive, making the economic stability of the solar panels questionable for structures that are near the power grid. Even though the financial considerations make such technology a low option, the economic and social sides are strong enough to have the technology be considered sustainable.

Source : <http://letu-cefs.wikispaces.com/Financial+Considerations+for+Sustainable+Construction+Practices>