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SUSTAINABILITY ASSESSMENT – WHAT IS IT GOOD FOR?

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ABSTRACT

Building sustainability assessment schemes enjoy significant uptake worldwide. Viewing such schemes as a passive assessment is however to ignore the business and political context in which they operate. Successful schemes operate in a pseudo commercial manner, and offer potential for market transformation and marketing accolade, as well as simple assessment. Remarkably, little research appears to have been conducted to establish which of these most motivates the users of the schemes, or whether the assessments ultimately meet their needs. Closing this knowledge gap is, it is argued, essential both in determining whether a genuine business case exists for assessment, and also whether assessment leads to more sustainable buildings.

A research project is described which will address this issue, based upon case study projects. Explorative interviews will reveal motivations for advocating assessment. This output will then inform a second quantitative phase, measuring how well the various project team members' expectations were met. The case studies will be used to generate theory concerning the effectiveness of sustainability assessment. If proven on a larger scale, this theory may be developed to inform the future development of both established schemes, and of the many new schemes currently arising to serve emerging world economies.

Keywords: assessment methods, building assessment, environmental assessment, sustainability assessment, stakeholder motivation

INTRODUCTION

Current building practices are unsustainable. Modern buildings utilise finite materials in their construction, and consume fossil fuels through every phase of their life. As a result it has been estimated that buildings are responsible for around 30% of GHG emissions worldwide (UNEP, 2009). Their impact in terms of sustainability is however both more extensive, and more complex than that. Buildings exist in a social, economic and environmental context, and their influence ranges across the triple bottom line. They require land, consume water, generate waste, affect transport

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patterns and utilise materials which may be mined, grown and manufactured in near and remote locations. They also provide space for a vast range of social and economic activity to take place, as well as contributing directly to local and global economies. Through their construction, use, maintenance and demolition, buildings have significant positive and negative effects across all three spheres of sustainability. Their overall environmental effects are however generally negative, furthermore such effects are often wide ranging and long lasting.

The current state of the art

If management requires measurement, then assessment of sustainability must be a precursor to moving from the state of unsustainability described above, to a state of future sustainability. The nature of this future state remains unclear, making objective measurement difficult. This has not prevented the task being attempted though, and in fact sustainability assessment for buildings has been available for over 20 years. The Building Research Establishment Environmental Assessment Method (BREEAM) is generally credited as being the first comprehensive Building Sustainability Assessment Scheme (BSAS) (Crawley and Aho, 1999). This was introduced in 1990 and there have been a proliferation of schemes since this time, with at least 60 broadly similar methods available for non-domestic properties worldwide (Boonstra and Pettersen, 2003; Cole, 2005; Gomes et al, 2008; Howard, 2005; Bitard, 2009; Alwaer and Kirk, 2011; Barlow, 2011; Lee, 2012). Such schemes tackle this highly complex theoretical problem in a rather pragmatic way. Discreet indicators are used against which buildings amass points, contributing to a final rating. By removing units from assessment in this way, it has become possible both to sidestep the issue of an uncertain destination, and to compare 'apples with pears'; that is to assign weight to different types of impacts where no objective measured basis exists. This tick box approach is practical and easily understood. A crucial disadvantage however, is that selection and weighting of indicators is rather subjective (Brandon and Lombardi, 2011), and the number of different schemes in operation is testament to this. The scope of schemes varies too, as although most have environmental issues at their core, they often also incorporate select social and/or economic indicators (Sev, 2009; Beradi, 2011). Furthermore many schemes operate at national level, and adopt existing nationally developed best practice as indicators, limiting their use to the country of origin (Ding, 2008).

Academic debate to date has centred largely on the validity and robustness of schemes. Fundamental differences persist between schemes, in formulation, scope and detail, and comparisons are often made between methods (Ding, 2008; Haapio and Viitaniemi, 2008; Beradi 2011). There is however some movement towards standardisation. An international standard now exists for the selection of indicators (ISO, 2006) and further work is underway within the European Union (BSI, 2010; Hakkinen, 2012) to standardise indicators and facilitate easier comparison between schemes. In terms of uptake, two major players appear to be emerging (Lee, 2012), with BREEAM and LEED (Leadership in Energy and Environmental Design) both now offering universal international schemes, as well as franchising their methods to individual countries. A rationalisation of the number of schemes in operation may well have appeal for some. A small number of internationally recognised schemes would allow comparison of buildings between countries, and may aid design

consultants operating internationally. On the other hand, international standardisation implies a consensus on form and content, which does not yet exist (Berardi, 2011; Alwaer and Kirk, 2012). Additionally, although sustainability assessment may be firmly established in certain developed countries, the results of its implementation are far from clear (Cole, 2005). The aims of the scheme operators may be transparent, but after over two decades there is little evidence to suggest why users carry out voluntary assessments, or whether they result in a more sustainable built environment.

Getting it right for the future

Despite a lack of consensus regarding content, BSAS are nevertheless becoming an established part of the construction landscape in many countries. BREEAM certification was achieved for 761 buildings in the UK in 2011 (BRE, 2012). This represents around 3% of non-domestic building projects commenced nationally in that year, and has increased from less than 1% in 2007, and just 0.3% in 2003 (Office for National Statistics, 2011). LEED awarded 3671 certificates in 2011 (predominantly in the US), with numbers having increased significantly in every year since its inception in 2000 (USGBC, 2012).

Uptake in absolute terms is still low however, particularly on an international scale. Consequently, the use of sustainability assessment schemes over the past 20 years in a discreet selection of developed countries could be viewed as little more than a pilot study. Before such schemes are further expanded, there is a need to evaluate their achievements to date. Remarkably this does not yet appear to have been attempted. This may be partly because it is unclear what overall measure of achievement could be used. BREEAM for example has multiple stated aims as follows:

Aims of BREEAM

1. To mitigate the life cycle impacts of buildings on the environment
2. To enable buildings to be recognised according to their environmental benefits
3. To provide a credible, environmental label for buildings
4. To stimulate demand for sustainable buildings

(BRE, 2013)

Interestingly, none of these four aims relate specifically to assessment. Assessment may describe the function of schemes, however their purpose could perhaps be better summarised as one of market transformation. In the case of BREEAM this is explicit as shown above, with both the means and aim of transformation clearly identified. LEED is similarly described by its operators as being part of "a mission of market transformation" (USGBC, 2013). If the effectiveness of these and other similar schemes is to be tested before they are further expanded and emulated, then perhaps it is market transformation (rather than accuracy of measurement) that should be measured.

Voluntary schemes versus legislation

Sustainability assessment methods have traditionally been employed as voluntary schemes (Cole, 2005; Beradi, 2011) and the reasons for this demand some analysis. If increasing the sustainability of buildings were the aim, then further regulation would appear to be the surest route to this. In the UK legislation has been used to address the energy consumption of new buildings, through Building Regulations. The Code for Sustainable Homes (CSH) has also been incorporated into Building Regulations, making comprehensive sustainability assessment mandatory for new domestic properties. For many governments a market led transformation may be both ideologically and economically preferable however, particularly for existing buildings. The fact that schemes do currently operate successfully on a voluntary basis certainly implies that there is a business case for assessment, at least for some properties. What this does not reveal however is to what extent this business case may be based upon achieving a more sustainable building, versus achieving a certificate of sustainability.

Hayes (2012) identifies 3 main ways in which a business case can be built for sustainability. These are 'Legal Compliance and Financial', 'Business Assurance and Viability', and 'Reputation and Brand Value'. BSAS can certainly provide legal compliance where schemes are incorporated into legislation (for example town planning policy) however this top down approach does not demonstrate a business case as such. BSAS often also promote particular measures which may generate on-going financial benefits, such as energy efficiency. Such discreet issues are however already well understood by designers, and could be incorporated without incurring the costs associated with a wider assessment. It is therefore perhaps in the second two categories which BSAS have the greatest potential. Business Assurance and Viability concerns the mitigation of risk. BSAS typically cover a number of issues which may threaten future business operation. Flood risk has for example been assessed by BREEAM since its inception, and has now become a serious consideration for many property owners and occupiers in the UK (Pottinger and Tanton, 2012). Protection against rising energy, water, fuel and waste disposal costs are also implicit in many schemes. Requirements relating to providing a healthy indoor environment may also substantially improve worker productivity.

Hence achieving a rating may be seen as shorthand for future proofing against a number of real issues, and may be adopted as such by property owners, occupiers and financiers. Ironically obtaining a rating may also be seen as future proofing against the very method itself, where there is potential for this to be incorporated into legislation in years to come. Finally, and significantly, BSAS have potential to contribute to an organisation's reputation and brand value. In this case however it is primarily the certificate which is of value, rather than the change effected in the building. By recognising the incorporation of sustainable features in a building, certification makes it possible to obtain recognition from staff and customers, and to generate positive publicity for the building and the organisation.

The business case for buildings with a broad positive approach to sustainability therefore exists in theory. It has not however been conclusively demonstrated.

Certificated property does not generally generate rental premiums or additional capital value, compared to similar conventional buildings (Sayce et al, 2010). It has been suggested that sustainable buildings may become the benchmark, with unsustainable buildings perhaps suffering a drop in value (a brown discount, as opposed to a green premium), however this effect also remains to be proven. The Royal Institute of Chartered Surveyors (RICS) have recently issued a draft guidance note in relation to the impact of sustainability on valuation (RICS, 2013), which may point towards greater recognition of features such as energy efficiency in the future. This does not necessarily support BSAS as a means of demonstrating this value though, as their scope is perhaps too wide. Property investment professionals for example already make use of a bespoke system, Ecopas (IPD, 2013), which measures particular sustainability features focused on their business interests. It is perhaps therefore in terms of brand value that BSAS have the greatest potential. Perversely this may be because broad spectrum assessment has a credibility based upon pointedly ignoring the specific business case of the applicant. Whether ratings for buildings generate net value in this way is difficult to measure, although it is likely to vary considerably depending on building type and business sector. Enhancing reputation does rely on achieving exceptional ratings however, and this value may fall away in the future if assessment becomes the norm. In reality it is likely that some organisations will benefit from a combination of the risk reducing aspects of sustainability, along with brand enhancement. Others will perhaps be able to generate no business case for either.

Proposed research project

The discussion above suggests that building owners may generate a financial return from BSAS in certain circumstances, but that this may be difficult to predict or quantify. Cole (2005) describes an ambiguity of purpose inherent in BSAS, and calls for a redefining of roles. Eight years further on, both the reasons for using BSAS and their effectiveness are still to be evaluated. Efforts instead appear to have been focused on further refinement of detail and widening of scope, with the most popular schemes seeking to establish themselves on a global scale. The underlying research needs arguably therefore remain similar to those described by Cole in 2005; that is to examine BSAS in their business context, to find out why organisations voluntarily expend money carrying them out, and to measure the effects that they are having upon completed buildings. As a first step towards this we will be conducting an explorative study using a number of case study buildings for which BSAS ratings have been obtained. The study will make use of a number of academic buildings at Anglia Ruskin University in the UK, and will be broken down into two phases. The first phase will involve in-depth structured interviews with those responsible for specifying and implementing the ratings i.e. the building owners, the building managers, and the design teams. This explorative phase will aim to establish reasons for specifying an assessment. It will in turn unveil the expectations that the various stakeholders had, both of the assessment process, and of its effect on the completed building. Finally it will examine the level of engagement and knowledge of the various individuals for what is a complex process, and seek to uncover possible tensions between achieving the rating, and other goals.

Phase two of the study will seek to determine how well the expectations of the main stakeholders have been met for the completed buildings. This study will respond to the results of Phase 1, for example if there was an expectation that achieving a BSAS rating would result in lower energy usage, then energy usage will be measured and benchmarked. Similarly if there was an expectation that a pleasant indoor environment would be created, then this may be tested and benchmarked using a post-occupancy evaluation method. Combining the results of the two phases will allow us to generate a series of paired theories, for example:

1) Building owners expect that achieving a BSAS rating will result in lower energy costs
2) Achieving a BSAS rating does/does not significantly reduce energy costs

Due to the relatively small scale of the study, these paired theories will be tentative, and will require testing using a wider study. The information obtained will however form a significant step towards greater understanding of a highly complex area of building design.

Conclusion

BSAS are more than a means of measuring sustainability. Many schemes have either explicit or implicit aims relating to market transformation; that is to actively improve the sustainability of buildings. BSAS have established a level of voluntary uptake in certain countries, although total uptake is currently small as a proportion of global construction. Numbers appear to be increasing yearly however, and there is great potential for further uptake, particularly in developing countries.

Given this situation, it is concerning that little information appears to exist regarding the effect that carrying out BSAS may have on buildings. It appears to be generally accepted that measuring sustainability will drive up standards, by means of rewarding good practice. There is however little evidence available to support this. This position is further complicated by ambiguity as to the motivation of those commissioning assessments. There is no generally applicable business case for sustainable buildings themselves, suggesting that the recognition of an award may often be the main driving factor for voluntary assessment. Should this be the case then the improvements gained in the sustainability of buildings may not only be unknown, but also irrelevant to those paying for them. If true, this suggests a dangerous disconnect between scheme operators and their Clients.

By carrying out a detailed case study investigation, the particular motivations for using BSAS for these projects will be revealed. Different stakeholders may of course have different expectations, and success may therefore need to be measured from a number of viewpoints. Ultimately however, it should be possible to say why a BSAS was used for these projects, and what the consequences were. It is hoped that these results will be the first step in a wider evaluation of BSAS. Tentative theory generated at case study level could be used to inform a wider national study, and ultimately lead to an investigation of BSAS on an international scale. Such a study is

surely essential in developing the full potential of BSAS. Schemes may have proven effective in raising the profile of sustainability in construction and providing a marketing tool for building owners and constructors. When measured against their own goal of market transformation however, BSAS are still largely unproven.

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