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## Urban sustainability standards: predetermined checklists or adaptable frameworks?

Dimitra Kyrkou<sup>a\*</sup>, Roland Karthaus<sup>a</sup>

<sup>a</sup>Place Research Lab, University of East London, School of Architecture & the Visual Arts, University Way, London E16 2RD,  
UK

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### Abstract

International credit-based urban sustainability standards have generally been compared according to the components that they assess, rather than their fundamental structures, the methodologies of their application and their commercial or open-source status. This has tended to reinforce assumptions that a form of pre-determined checklist is the most appropriate solution for a wide range of circumstances. A deeper understanding of some of these standards, generated through applied research by Place Research Lab at the University of East London, reveals the alternative potential for adaptable frameworks that are more sensitive and appropriate to the particular priorities of different places.

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### 1. Introduction

There is an apparent tension between the commercial desire for certification of achieving a prescribed standard and the more open process of education and behaviour change. “No matter how well-intentioned a green certification is, if the incentives are not sufficient to change behaviour, then it will not gain participants and will ultimately fail”[1]. This approach derives from the ‘marketing’ sector, where the incentives are essential to persuade the market for the final product, no matter whether there is a certification or not. According to numerous studies, there is a significant body of participant developers

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\* Corresponding author. Tel.: +44-751-866-4102

E-mail addresses: [dkyrkou@gmail.com](mailto:dkyrkou@gmail.com)

who believe that it is all about marketing, with the ‘green certification’ to act as an advertisement for the developing company, following more a template of a ‘predetermined checklist’.

It is true that a growing number of different assessment tools and frameworks have been developed during the last years in order to support conscious environmental decision making in building scale around the world. Edward Ng argues that “the fact that these systems were developed after gaining experience with assessing individual buildings is remarkable telling, as development has been from the scale of individual building upwards to a larger scale and this have significantly influenced the environmental design of both building and urban scale” [2].

Although there is a satisfactory amount of information on research concerning environmental assessment systems for buildings, the information provided for urban-scale assessments is still limited. It is crucial therefore, that the scope of sustainability assessment systems to expand from the energy performance of individual buildings to ‘wider’ aspects of urban scale assessment related to places, as it is the cities as a whole that relates to more or less sustainable behaviour. As described clearly by Jane Jacob and supported by New Urbanism, “a sustainable way of living should effortlessly derive from the way we design our sustainable neighbourhoods, as green neighborhood developments are beneficial to the community and the individual as well as the environment” [3]. In general, green neighbourhood developments respect historical resources and the existing community fabric; they preserve open space and encourage access to parks as the character of a neighborhood, including its streets, homes, workplaces, shops, and public spaces. There is an implicit assumption in Jacobs thought, that these factors, affecting urban life, are somehow fixed and can be predetermined [4].

Realising then the wider role of the city in sustainability, several existing assessment systems have recently introduced versions that address the broader context of urban scale in the adaptation of our built environment. For example, the US Green Building Council’s (USGBC’s) LEED for Neighbourhood Development, the UK BREEAM Communities and SPEAR developed by Arup, as well as the Japanese CASBEE-UD are some of the systems currently being applied worldwide.

However, challenges of sustainability are different from place to place, setting a question on the adaptability of the above systems. And if these systems truly aim to develop successful sustainable places, they need to respond to a broader understanding of sustainability as defined by UN. The three-dimension concept within Brundtland definition: “Sustainable Development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” [5], points out that sustainability means long-lasting, rather than simply energy-efficiency, aiming to a durability and a continuous provision for people’s needs. And nowadays, within a prevailing globalization, this durability highly depends on the provision of the character of a place. As such, there are several challenges for adaptable frameworks that are more sensitive and appropriate to the particular priorities of different places.

Therefore, this paper aims to contribute to the prevailing debate of environmental assessment systems and to further enhance the currently limited research on urban sustainability assessment systems. In particular, it focuses on the analysis of the use and application of ‘LEED for Neighbourhood Developments’ and ‘BREEAM Communities’, as these two rating systems are the most accepted and prevailing ones in the industry with the highest amount of applications worldwide, investigating their potentials for adaptability according to different places, rather than just perform as a prescribed checklist.

## **2. Applied research methods**

As the main purpose of this thesis is to investigate the potentials for adaptable frameworks that are more sensitive and appropriate to the particular priorities of different places, two main urban assessment systems were reviewed and compared. As mentioned already, these two rating systems were chosen as

they are the most accepted and prevailing ones in the industry, with the highest amount of applications worldwide, even though they were originally conducted as national rating systems (LEED-ND for the US and BREEAM Communities for the UK). The findings for the above investigation are based on research conducted by the ‘Sustainable Urban Design Research Group’ and the ‘Place Research Lab’ of the University of East London.

First, LEED-ND and BREEAM Communities were reviewed and analysed here as documents, comparing their aims, their structure, the rating system and the credits they use, the general framework behind them and their general content. Therefore, as the above two systems are the most popular ones worldwide, their comparison provides this paper with the first findings on whether there are similarities on the criteria and on the aspects being assessed by the two national systems that work also at global level and it can then offer a feedback, useful for any of their updates or other urban assessment systems, aiming to introduce more place-depending credits.

In addition, the research involved the application of both systems on a proposed, future scheme, investigation on the potentials of the application of LEED-ND on an infill Georgian block at London and research on the general potentials of using an assessment system as a teaching tool.

### **3. General Structural Comparison between LEED-ND and BREEAM Communities**

Interestingly enough, environmental certification programs have been in existence for a long period, started almost at the same time with the release of the definition of ‘sustainable development’ by Brundland Report in 1992. In particular, the Building Research Establishment Environmental Assessment Method (BREEAM) was established in 1990 in the United Kingdom and Leadership in energy and Environmental design (LEED) was modelled after that in the US. Their urban assessment systems were first launched though in 2009.

To begin with, the two rating systems are based on different scoring methods. Although they are both ‘point-systems’, in the case of LEED-ND it is more straight forward to obtain the points, where specific requirements or a choice between different options would lead to the target score. In contrast, in case of BREEAM Communities a weighting system is been adapted which, although offers opportunities for BREEAM Communities to be adapted in different local situations, it is only referred to UK base and tends to make the assessment process more difficult.

There is an interesting difference in the number of the categories at each of the systems. The Communities assessment document is free to download from the BREglobal website and is structured over 8 main categories, where each credit is simply structured to include only the assessment method, with no statement of objective or supporting evidence, whilst LEED-ND only over 3, more open and general categories. This makes LEED-ND more abstract and sometimes difficult to follow, but at the same time it offers more potentials for adaptability.

In both systems, there is an opportunity to gain additional points with some extra categories, which adds a 10% in case BREEAM Communities and 10 points in the case of LEED-ND.

In addition, at BREEAM Communities, there are several filters to be applied in each of the categories and subcategories (= credits). Although in LEED-ND all the credits are mandatory, the filters in BREEAM Communities involve the size or the type of the development, its status (national or regional) and define which credits are mandatory and which not.

To begin with, the first category of BREEAM Communities is CLIMATE CHANGE which finds its equivalent credits within two categories of LEED-ND: SMART LOCATION & LINKAGE (SLL) and GREEN INFRASTRUCTURE & BUILDING (GIB). Both of the systems seem to take under account several environmental issues, like flood risk, the heat Island Effect, stormwater management and energy

efficiency of the site. However, only LEED-ND talks about district heating and light pollution even accredited with the minimum of one 1 point.

The second BREEAM Communities' category involves COMMUNITY issues. It is rather interesting here that there is a whole category in this system consisting of four credits related with community involvement and consultation, management and operation, while in contrary, in the case of LEED-ND there is only one credit related with the above issue and includes only community involvement at the design stage.

The next BREEAM Communities' category is associated with PLACE SHAPING. Credits here are related with two of LEED-ND's categories, both SLL and NEIGHBOURHOOD DESIGN AND PATTERN (NDP). Both of the systems seem to take equally under consideration issues related with land uses, brownfields, landscaping, design parameters for affordable houses, universal design, and access to facilities, green spaces and amenities. In addition to those issues, LEED-ND gives a high scoring for the design of a walkable, compact and mixed-use neighbourhood which accounts for the 29% of the total scoring.

To continue with, there is a whole category in BREEAM Communities dedicated to ECOLOGY AND CONSERVATION, which counts for the 12,5% of the total scoring, whilst in LEED-ND there three credits related with the site design for habitats or wetlands and water body, their restoration and long-term management conservation, which counts only for the 3% of the total scoring.

Taking into account the above last two categories it seems that in general, as far as the LEED-ND scoring is concerned, it tends to be more heavily weighted toward rewarding new urbanism principles rather than low environmental impact development. "While these two principles are not mutually exclusive (e.g. preserving open space and conservation areas are encouraged under both), there are significant differences in the ecological emphasis between the two, with BREEAM Communities tending to address more environmental concerns" [6]. This could be rather explicit, when considering that LEED-ND is modelled under the principles of New Urbanism, whilst BREEAM Communities is trying to comply with the strict UK regulations about sustainability.

The fifth category at BREEAM Communities is associated with TRANSPORT AND MOVEMENT. As LEED-ND was modelled according to the 'Transit Oriented Developments' (TOD's) principles, it is further focusing on transit facilities.

Interestingly enough, the next BREEAM Communities' category about BUSINESS AND ECONOMY has no equivalent with LEED-ND. Here, the aim of BREEAM Communities is to promote new business an investment within the project development which could be related with LEED-ND effort for MIXED-USE DEVELOPMENT credit.

Finally, the last category of BREEAM Communities is BUILDINGS which is directly related to LEED-ND category of GREEN INFRASTRUCTURE & BUILDING. Here, both of the systems give high scoring for certified green buildings, energy and water efficiency in building scale and infrastructure issues.

#### **4. Findings of the applied methods**

##### *4.1. The Clay-Farm project: application of LEED-ND and BREAM Communities*

The general structural comparison between the two systems helped to apply both of the two systems in one single project, the Clay Farm, a proposed new urban development by Placepartner at the southern part of Cambridge, UK. This report reviewed the proposed development at Clay Farm against LEED-ND and the BREEAM Communities assessment benchmarks. This pilot project study aimed to give an estimated rating for the scheme against these two benchmarks and to use these to indicate how higher ratings might

be targeted. The potential rating indicated how sustainable the scheme was considered to be in light of the relevant assessment criteria of each benchmark, but these criteria were subject to challenge as part of the wider question of this research.

The provided documentation had been reviewed only on a general basis against criteria described in the benchmarks. At a minimum, it would be necessary to comply with US regulations in order to apply the existing LEED ND criteria in its fullest form and target actual credits. However, a view was taken on how to convert these criteria to a UK planning and regulatory context, without challenging or adapting it. The methodology used to complete this translation was based on informed assumptions. As argued by Emma Marchant, this process of translation forms the basis of evidence that could be used to inform the development of a LEED ND scheme suitable for assessing masterplan development in the UK [7].

The above applied method gave some very interested findings on the application of the two assessment systems. First, although the final high scoring of the scheme against both of the systems, it was found that BREEAM Communities was highly difficult to be reviewed as it is not easily accessible, with no published data available for non-assessors, comparing to the high transparency of LEED-ND, widely provided online by US-GBC. In general, more transparency will allow better comparison of the relative merits of each system which will help to promote the sharing of best practice. Comparison with other standards markets would then suggest that “once there is transparency, the market will mature to allow ‘licensing’, ‘cross certification’ and ‘multiple labelling’”.

Furthermore, the weighting system used for the final scoring in BREEAM Communities made the reviewing of the process more complicated, whilst LEED-ND offered flexibility on the application. This showed that, although LEED-ND is designed to assess US-based projects, it can easily be adapted and offer an easily conducted scoring at the very first stages of the design process and thus could be even used as an educational tool for designers.

As a conclusion to the process, the research team presented the findings to Placepartner in a workshop session. The exploratory and far-reaching nature of the discussion clearly demonstrated the educational potential of LEED for commercial developers.

#### *4.2. A reviewing of the application of LEED-ND on a Georgian block*

The potentials for adaptability of LEED-ND in a non-US-place were then further investigated, with an application of the system on a Georgian Block within London. An existing urban pattern, with a highly interesting architectural character was chosen in order to ‘test the limits’ of LEED-ND’s adaptability.

In particular, the applied research method showed that the ‘CERTIFIED’ rating of the existing condition of the Georgian Blocks at the City of the Westminster against LEED-ND and the easily achievable ‘GOLD’ rating, demonstrated that the main characteristics of the Georgian Architecture and its urban pattern, together with some easily achieved interventions in the area could score as well as a new development that would intentionally be designed to meet LEED-ND requirements.

Although the research identified some credits that are very difficult –but not impossible–to be achieved for an even higher scoring, some easy-to-achieve credits proved that it is highly potential for a re-development of the area or even a new development with the characteristics of the Georgian Architecture and its urban pattern, to easily achieve a high LEED-ND scoring. It is therefore assumed that this particular type of architecture includes the same basic principles like New Urbanism and compact development, showing that when it could be combined with the nowadays ‘green’ technologies, it could offer one of the most sustainable forms of neighbourhood sustainability. What is more important though for the particular research of this paper, it is that it shows the adaptability of LEED-ND as an assessment system and in addition, how its wider framework can easily fit with the definition of sustainability as a

long-lasting process, aiming to a durable adaptability of the built environment and to a continuous provision for people's needs.

#### *4.3. Assessment systems as a teaching tool*

Members of the research group are involved in teaching on the Master's course in Sustainability and Design at the University of East London and continue to extend the body of applied research through student thesis projects, applying LEED ND to different situations in London. The transparent nature of the system makes it ideally suited for teaching purposes and also leads to an understanding of the city as an entity composed of 'layers': history, geography, economics, landscape, geology, infrastructure and so on. This relationship is explored through 'layered models' which serve to highlight the strengths and weaknesses of LEED ND and its sensitivity to different factors. This ongoing work continues to generate a body of evidence for the potential for an ever more open and adaptable framework for sustainable urbanism.

### **5. Conclusive discussion on the findings**

The two systems considered also have two different commercial bases that are relevant to the way they are administered and delivered. Although both systems require fees to be paid for their use, BREEAM Communities is a 'product' owned by a commercial organisation, BREglobal Limited. Whilst it is a non-profit distributing company (it does not have shareholders), it markets the BREEAM Communities standard as a product to increase its market share. LEED ND is owned by the US Green Building Council, which is a not-for-profit 'association' under American company rules. It generally promotes the use of its standard solely within the US, though it is being applied semi-informally in many places around the world.

Whilst the degree to which these standards and their ownership organisations are more or less commercial can be debated, there is a clear difference apparent in the form of the standards themselves. The full LEED ND assessment standard is available to any member of the public for the cost of the hardcopy publication (\$160). This document is accessibly and legibly structured and written. The standard is divided into three main sections, which relate to different aspects of sustainability in a neighbourhood development, under each of which are listed a series of prerequisites and credits.

There are two additional sections relating to process and discretionary credits. Each prerequisite and credit is structured to include the intent (ie. the strategic objective), a detailed description of the assessment method and a list of evidence and references, indicating how achieving the credit will meet the original intent (see example of credit at Appendix A). The document also contains background information and helpful matrices on how individual credits interrelate across the whole standard.

The greatest difference between the application of these standards, however is that LEED ND can be applied without the assistance of a LEED accredited assessor (although one is required for certification), BREEAM Communities cannot be, as some aspects of the assessment method are decided only through a process of direct consultation with BREglobal. This has two important implications: the first is that it is not possible for anyone external to the Communities process to know how a particular scheme has been assessed and therefore on what basis it achieves the rating that it achieves; the second is that the standard has little wider educational potential beyond the simple rating of individual systems. These are important differences with LEED ND and, indeed the USGBC makes these two issues explicit objectives of its standard. The inclusion or non-inclusion of each credit's 'intent' and the evidence base for achieving it is also significant in terms of auditability and adaptability. With LEED ND, a researcher can examine the evidence base and form their own opinion as to whether or not it is sound; this is not possible with



Communities. Further, one can examine the intent and evidence-base in relation to a particular circumstance (ie. the US) and reconsider how that intent should be met in a different circumstance and gather equivalent evidence to support it. This difference in the documents results in a difference in their potential application: one is inherently more adaptable than the other.

## 6. Conclusions

The challenges of sustainability at the urban scale are more complex and broad-ranging than at the building scale. In that notion, several urban assessment systems have been developed the last few years aiming to support and further promote sustainable integrated solutions for urban scale developments. However, it is necessary those systems to offer at the same time the framework for achieving successful sustainable solutions, and not only to work as tools with a simple checklist of requirements. Similarly, the competition between different systems has resulted in an increase debate about their use and application; however, as “the prerequisites of the certification process differ depending on the certification systems” [8], it has led this debate to mainly focus on the contents of the systems.

As such, the thesis of this paper argues that some systems have a much greater potential than a simple checklist, which quickly becomes out of date. US-GBC has been working towards that aim by offering to its updated LEED-ND 2012 Version more transparency and flexibility and less a standard checklist, setting priorities with weights that can be adjusted according to the particular needs of different places.

It is worth mentioning though that the potential that each system has for becoming an adaptable framework might sometimes be difficult to reconcile with the nature of the body organisation behind it; however, each body organisation should consider the numerous benefits of an increased adaptability of its framework. Furthermore, no group or organisation can have a monopoly on what constitutes sustainability; as such, the market needs to allow for a mature ‘licensing’, ‘cross certification’ and ‘multiple labelling’, based on a set of criteria that can evolve and adapt.

All in all, this paper is just a starting point for a discussion between the increasing number of scheme operators developing and running sustainability assessment methods for neighbourhood scale developments, suggesting that opportunities exist for new approaches to urban sustainability assessment systems, that will allow future research to focus on frameworks with a transparent and auditable structure as a better response than an ever-more detailed set of criteria for each and every different place.

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## **Appendix A. Example of LEED-ND, Smart Location & Linkage, Credit 2: Brownfields Redevelopment**

1-2 Points

### **Intent**

To encourage the reuse of land by developing sites that are complicated by environmental contamination, thereby reducing pressure on undeveloped land.

### **Requirements**

#### OPTION 1. Brownfield Sites (1 point)

Locate the *project* on a site, part or all of which is documented as contaminated (by means of an ASTM E1903-97 Phase II Environmental Site Assessment or a local Voluntary Cleanup Program), or on a site defined as a brownfield by a local, state, or federal government agency; and remediate site contamination such that the controlling public authority approves the protective measures and/or cleanup as effective, safe, and appropriate for the future use of the site.

OR

#### OPTION 2. High-Priority Redevelopment Areas (2 points)

Achieve the requirements in Option 1;

AND

Locate the project in one of the following high-priority redevelopment areas: EPA National Priorities List, Federal Empowerment Zone, Federal Enterprise Community, Federal Renewal Community, Department of Justice Weed and Seed Strategy Community, Department of the Treasury Community Development Financial Institutions Fund Qualified Low-Income Community (a subset of the New Markets Tax Credit Program), or the U.S. Department of Housing and Urban Development's Qualified Census Tract (QCT) or Difficult Development Area (DDA).