Sustainable Cities and Society 18 (2015) 32–43

Contents lists available at ScienceDirect

Sustainable Cities and Society

journal homepage: www.elsevier.com/locate/scs

A need for balanced approach to neighborhood sustainability assessments: A critical review and analysis

Ali Komeily*, Ravi S. Srinivasan

M.E. Rinker, Sr. School of Construction Management College of Design, Construction and Planning University of Florida, Gainesville, FL 32611, USA

ARTICLE INFO

Article history:
Available online 28 May 2015

Keywords:
Neighborhood sustainability assessment
Pillars of sustainability
Livable city

ABSTRACT

With over 70% of the world population projected to live in urban areas by 2030, the role of cities in sustainable development is gaining greater momentum. Creating healthy and livable communities have become a priority in many regions, giving birth to several neighborhood sustainability assessment tools. Yet, these tools largely fail to consider and integrate the four pillars of sustainability namely, environmental, social, economic, and institutional dimensions in a balanced, equitable manner. Without a detailed analysis of the most recent versions of widely used NSA tools, the impact of these tools toward sustainability may be inaccurately measured and reported. Besides, it is crucial to understand the various credits implemented and/or ignored by stakeholders using such tools. With a balanced approach in mind, this paper examines five NSA tools and addresses four objectives namely, (1) to fill the gap in current literature by using the most up-to-date versions of NSA tools in the analysis; (2) to examine the current rating systems' ability to define the goals of sustainability and to measure their progress; (3) to identify which sustainability criteria are applied most frequently by stakeholders and which ones are ignored; and (4) to offer timely and imminent issues relevant to current NSA tools. The first three objectives listed above are dealt with using actual projects implemented, i.e., data from 115 projects, one of the largest dataset used in any study at this time. Using the results from the analysis, this paper concludes with a series of recommendations for a balanced approach to NSA.

1. Introduction

The concept of sustainability dates back to 1970s. Since the publication of the Brundtland (1987) report "*Our common future*", the terms "sustainability" and "sustainable development" have been widely embraced by public and private sectors of our society. Since then, there has been much debate about the definition of these terms (Gibson, 2006) with the emergence of a plethora of competing definitions for sustainability (Hopwood, Mellor, & O'Brien, 2005; Robinson, 2004). New definitions are introduced endlessly, sometimes obscuring the concept altogether (Berardi, 2013). This lack of consensus on the definition of sustainability has been attributed to its ambiguous and complex meaning (Doughty & Hammond, 2004; Evans & Jones, 2008), as it may mean different things to different organizations or stakeholders. Although this vagueness might seem negative, Robinson (2004) noted this is a constructive ambiguity as leaving this key definition undefined and open would be beneficial in reaching the best result. In essence, if the definition of sustainability is vague, so will be its assessment (Berardi, 2013). The significance of the definition of sustainability cannot be understated especially as they directly impact the indicators of sustainability and, therefore, the projects themselves.

Nevertheless, there is a broad consensus on the concept of sustainability with "environmental," "social," and "economic" dimensions, which are referred to as the three pillars of sustainability (Elkington, 1997). Whereas environmental sustainability relates to making decisions with the intent of protecting the natural environment, social sustainability is about actively supporting the capacity of current and future generations to create healthy and livable community by promoting equity, diversity, livability, democracy, etc. Economic sustainability refers to using resources wisely, efficiently, and responsibly for long-term benefits. Needless to say, there is a growing desire to consider "institutional" dimension, i.e., those that

Abbreviations: LEED, leadership in energy and environmental design; BREEAM, building research establishment environmental assessment methodology; DGNB, Deutsche Gesellschaft für Nachhaltiges Bauen (German Sustainable Building Council); CASBEE, comprehensive assessment system for built environment efficiency; USGBC, U.S. Green Building Council; NSA, neighborhood sustainability assessment.

* Corresponding author. Tel.: +1 650 8629386.
E-mail address: komeily@ufl.edu (A. Komeily).

http://dx.doi.org/10.1016/j.scs.2015.05.004
2210-6707/

relates to the policies, governing principles and structures, and regulations as the fourth pillar of sustainability (Spangenberg, Pfahl, & Deller, 2002; Valentin & Spangenberg, 2000; Wijngaarden, 2001).

At the outset, the role of cities in sustainable development has become much more prominent for several reasons particularly, with more than half of the world population living in urban areas, and expecting to have this number increased to 72% by 2030 (United Nations Population Fund, 2007), as well as urban sprawl and its detrimental effect on the environment (Jaeger, Bertiller, Schwick, & Kienast, 2010). This recognition is the result of the growing awareness that cities are the pioneering actors in addressing sustainability performance of its buildings and other infrastructure. The concept of sustainable city has gained significant political momentum worldwide (Dempsey, Bramley, Power, & Brown, 2011). As Choguill (2008) noted, cities cannot contribute to overall sustainability unless its built environments are sustainable. It is not a surprise that both planners and policymakers have increasingly come to understand the importance of neighborhoods as the building blocks of cities (Searfoss, 2011) and also recognizing them as nearest environmental, social, and economic level to the citizens in which sustainability can be meaningfully assessed (Berardi, 2013).

1.1. Neighborhood sustainability assessment tools

Having a significant share of total energy consumption and related emissions, buildings and their environment are, among others, the primary focus of sustainability assessment. This has resulted in a variety of building assessments such as building rating systems, certificates, Life Cycle Assessment (LCA) based tools, technical guidelines, assessment frameworks, and checklists (Haapio, 2012). Such assessments are essential to stimulate dynamic and open dialogs and encourage deeper understanding of design and practice (Conte & Monno, 2012). Some of the well-known examples are BREEAM (United Kingdom), LEED (United States), Green Globes (United States), CASBEE (Japan), and DGNB (Germany). There are numerous building-level tools developed by various organizations including government entities worldwide.

However, existing building assessment tools are unable to meaningfully capture the interaction between buildings and their infrastructure. Moreover, they fail to consider and integrate the multiple dimensions of sustainability, particularly social and economic dimensions and may induce the idea that sustainability is achievable "by working at the margins" rather than considering the complex building-urban relationships (Conte & Monno, 2012; Richardson & Cashmore, 2011). These deficiencies emerged as an encouragement for reconsidering the spatial boundary of sustainability assessment, by introducing neighborhoods as a viable scale of assessment within which all pillars of sustainability can be assessed. As a result, NSA tools are increasingly gaining momentum universally. Appendix A lists some of these NSA tools. NSA tools are also referred as urban community assessment tools, district sustainability assessment tools, neighborhood sustainability rating tools, and sustainable community rating tools. In the past few years, as the number of NSA tools started to grow, the number of research publications contrasting the development of such tools and their comparison with actual implementation grew as well.

1.1.1. NSA tool development study

Several studies have investigated the categories and evaluation criteria in NSA tools through comparison, highlighting their strengths and weaknesses, and/or providing recommendations for future improvements. Haapio (2012) analyzed three NSA tools (LEED-ND, BREEAM Communities, and CASBEE-UD) to discuss the current situation of assessment for urban communities. In this study, Haapio emphasized strong linkages between tools and their region and the importance of sharing knowledge and experiences in tool developments. Sharifi and Murayama (2013) conducted a comprehensive review on seven NSA tools (LEED-ND, CASBEE-UD, BREEAM Communities, HQE2R, Ecocity, SCR, and ECC) providing additional insights by introducing a framework for examination of NSA tools. In this study, they criticized the tools for underperforming in the social, economic, and institutional aspects of sustainability. In other words, the environmental aspects were adequately taken care while there is still a lack of an adequate mechanism for local adaptability and participation. Berardi (2013) compared three NSA tools (BREEAM Communities, CASBEE-UD, and LEED-ND) and concluded it is necessary to consider evolution of communities in assessment.

The feasibility of developing global standards for NSA tools was assessed by Sharifi and Murayama (2014b), particularly investigating how NSA tools performed in different contexts. Results showed that identical projects could be rated differently under different NSA tools, which reflects the diversity of opinions about suitable way of addressing sustainability at the neighborhood level. Their study concluded that the use of a global standard is undesirable and suggested creating a database of all relevant criteria and indicators and contextualizing them based on the project.

1.1.2. NSA tools' project implementation study

Garde (2009) surveyed seventy three LEED-ND registered pilot projects in the U.S. to examine the extent to which sustainability criteria were incorporated in different projects and also to understand if there are trends in the planning and design of the projects. Garde tabulated the criteria that were used identifying the most and least used to evaluate the rating systems. Based on the study, Garde recommended planners to consider local and regional conditions as basically complying with LEED-ND alone cannot guarantee a sustainable neighborhood development. As part of their study, Sharifi and Murayama (2014a) analyzed the scorecards of 97 LEED-ND pilot projects and showed the frequency of the criteria used in those projects; it is to be noted that the study results were in sync with those of Garde.

Yet, with the periodic updates to rating systems, both in terms the credits and the requirements for evaluation, the studies discussed previously in this paper may not be applicable for current and future neighborhood progression. Without a detailed analysis of the most-recent versions of widely used NSA tools, the impact of these tools toward sustainability may be inaccurately measured and reported. Besides, it is crucial to understand the various credits implemented and/or ignored by stakeholders using such tools. From the stakeholders' and NSA tool developers' point-of-view, it is crucial to evaluate the tools' adoption of the *four* pillars of sustainability i.e., if they are balanced with equitable weights. It is to be noted that the authors do not suggest equal weights for the balanced approach, i.e., in terms of quantity as a measure, rather an equitable one for sustained neighborhood growth.

Balanced approach toward sustainability must be an inseparable part of sustainability assessment. Balanced approach means to have a balanced structure such a way that the resultant implements the four pillars of sustainability in an equitable manner. Consequently, the sustainability assessment becomes deeper than just simple evaluation. Factors such as time dimension, i.e., performance over time, etc., come into play as well.

With a balanced approach in mind, this paper examines five NSA tools and addresses four objectives namely, (1) to fill the gap in current literature by using the most up-to-date versions of NSA tools in the analysis; (2) to examine the current rating systems' ability to define the goals of sustainability and to measure their progress; (3) to identify which sustainability criteria are applied most frequently by stakeholders and which ones are ignored; and (4) to offer timely and imminent issues relevant to current NSA