Original article

Sustainability indicator systems within urban governance: Usability analysis of sustainability indicator systems as boundary objects

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A B S T R A C T

While sustainability indicator systems (SIs) have proven to be valuable rational tools for improving the availability of information related to the relationship of cities and communities to natural limits, the indicators movement has achieved limited instrumental uptake in policy. This paper begins from a recognition that instrumental use of sustainability indicator systems is rare. Greater potential impact exists for SIs designed to be much more attentive to their conceptual and political values within their particular social and political context. In other words, greater attention to what has been called the governance of indicator systems, or the ways in which SIs fit as policy tools within a multilevel and multiactor governance context, is key to increasing their utility. This is particularly true given the need for decisive policy change, or even the introduction of a new development path, which is asserted within the sustainability agenda.

Understanding the real and potential utility of indicator systems within multiactor governance processes, in which their roles are primarily rhetorical, conceptual and political, is facilitated by thinking about indicator systems as boundary objects, tools which open up dialogue, information sharing, learning and consensus-building across different policy boundaries: between experts and nonexperts, formal government and different nongovernment actors, higher-order governments and lower-order governments. This paper offers a comparative analysis of three sustainability indicator systems in the North American context – Vancouver's Vital Signs (Vancouver Foundation), Seattle's Happiness Initiative, and LEED-ND (US Green Building Council) – all of which have shown some success in operationalizing a new policy boundary as a means of making conceptual and political contributions to governance practices. The specific boundaries operationalized, the different approach taken by each project, and the usability demonstrated by each project at that boundary in terms of salience, legitimacy and credibility, are assessed comparatively. In general, the trajectory in design and use of ecological and sustainability indicators demonstrates an increase in appetite, aptitude and numbers of channels for use in processes of governance; however, these factors vary with the local social–political opportunity structure. This analysis presents the advances made as well as the tradeoffs evident in these cases across the gamut of different forms of usability of nongovernmental indicator systems designed for use as boundary objects, and suggests a path forward for indicator work which aims to change policy, from a governance perspective.

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1. Introduction: sustainability indicators are positively normative!

Within the indicators movement, the end is near for the age of indicators crafted in laboratories, shielded by password protected spreadsheets and cryptic formulae. In its place, a true social theory of indicators is dawning. Social critique of indicators, of course, is nothing new (Mitchell, 2002; Hacking, 1990). What is new to this dawn is the normative position of cautious confidence being taken by social scientists seeking to stake out a socially and environmentally useful policy space for indicators.

Turning to sustainability indicator systems specifically, whereas these were originally designed to alert people to approaching limits of our environmental life support systems, they are currently hitting limits in terms of promoting the social and political change that is recognized as necessary for a sustainability shift. Since its origins in the early 1990s, the sustainability indicators movement has produced considerable "MRV" value – that is, value in terms of providing new input to decision making that is measurable, reportable and verifiable (Hak et al., 2012). However, while these attributes are sufficient for the instrumental use of indicators by policymakers "directly to improve the policy outcomes in the given policy area,"

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(Bell et al., 2011, 10), this kind of linear or instrumental uptake of indicators has been limited to rare cases of sectoral focus "with binding goals or objectives that are monitored and/or evaluated" (Bell et al., 2011, 9). Nor has instrumental use of sustainability indicators proven conducive to policy *change* through normative reconstruction of policy goals (Rinne et al., 2013; Rametsteiner et al., 2011; Weaver and Jordan, 2008).

Quite aside from their mostly undemonstrated instrumental roles when used as positivist tools, indicators may play conceptual and political roles at new boundaries of knowledge and action, as tools in communication, understanding and engagement (Cash et al., 2003). In conceptual terms, indicators may help in learning, understanding, and structuring the definition of policy problems and interpretation of trends and solutions in fostering change readiness through learning to think about policy problems and sustainability trends from different perspectives suggested by interpretations and relations offered within the indicator system. By exposing the subjectivity and bias inherent in interpreting any trend and presenting alternative interpretations as well as opportunities for dialogue on these, indicator systems play "a conceptual role by helping to diffuse such visions and ideas and to support alternative thinking and new concepts rather than leading to political action [directly]" (Bell et al., 2011, 11). At the same time, indicator systems can serve political roles in terms of legitimizing existing policies or policy actors or disrupting these dynamics through confrontation and conflict (Bell et al., 2011).

These conceptual and political roles for indicators speak to the potentially valuable position of indicator systems within contemporary governance as 'boundary objects' (Star and Griesemer, 1989) – intermediary between different policy actors, operating at new policy boundaries; between formal and informal policy roles; policy design and implementation; data inputs and trend outputs. Boundary objects are policy tools used to create a forum at the dynamic interface between different social arenas by organizations that come together to coproduce knowledge and decisions (Turnhout, 2009). In order to serve effective conceptual and political roles towards policy change, indicator systems must work as boundary objects. This is due to the conditions for change in the contemporary governance context, which are driven not by the force of rational argument and evidence so much as knowledge translation to different discourses, suggestive of connecting multiple goals and objectives, and the engagement of different actors. Indicator systems as boundary objects thus are collaborative efforts that "are both sufficiently stable and ambiguous enough to be able to connect different social worlds and allow for different meanings in each of them" (Turnhout, 2009, 410).

Cash et al. (2003, 8086) refer to the important 'boundary work' needed to facilitate a sustainability transition "at the interface between communities of experts and communities of decision makers." Here, our interest is in the fine-grained and broader base of research and action by the diverse groups of experts and nonexperts with different stakes and different limited decision making powers involved in the domain of participatory urban governance. Such indicator systems work at new boundaries within and across different institutional types, producing different priorities and weaknesses for indicators work and policy impact. We lack an adequate understanding of or approach to using indicator systems as such boundary objects. What this points to is a need, and perhaps a readiness within the field, more explicitly to develop "the governance of indicator processes" (Bauler, 2012, 41; Moreno Pires and Fidélis, 2012; Rametsteiner et al., 2011; Scerri and James, 2010; Ramos and Caeiro, 2010; Holman, 2009; Eckerberg and Mineur, 2003). Beginning from an observation of a commitment in the indicators field to find conceptual and political uses for indicator systems, a governance approach invites analysis of indicator

systems as boundary objects, which in turn demands explicit understanding of their usability.

In the interest of advancing this agenda, this paper presents an analysis of three indicator projects in terms of their utility within a reflexive politics of urban governance. Recent research by Bauler (2012) has advocated just such a path, focusing on evaluation of indicator systems' "usability profile." Usability is defined as: "the inherent, mostly implicit, potential of indicators to be considered by policy actors during their decision activities" (Bauler, 2012, 39). Usability analysis is proposed as a deliberative process of determining this utility of indicators at different boundaries between interacting groups in the policy realm. Building upon Cash et al. (2003), there are three core analytical elements[1]: legitimacy, credibility and salience. Each of these elements may be assessed differently by actors from different positions, such that a usability analysis may produce different results at particular policy boundaries being operationalized by an indicator system.

The operationalization of a politics of sustainability indicator systems in this context of multilevel governance will be demonstrated here through a comparative usability analysis of three systems in North America: Vancouver's Vital Signs, Seattle's Happiness Initiative, and the LEED-ND (Leadership in Energy and Environmental Design for Neighborhoods) system.[2]

A sizeable body of European research – all with interesting acronyms like PASTILLE Consortium (2002), MATISSE (Weaver and Jordan, 2008), IN-STREAM (2011), and POINT (Bell et al., 2011) – has dug into the questions of how indicators are used in policy, and how to improve their disappointing track record. The LIAISE (2009–2013) project is creating and maintaining communication and improved understanding between experts involved in impact assessment and the policy makers working on the EU Sustainable Development Strategy. Summarizing the perspective of these projects together, Weaver and Jordan (2008, 24) recommend that what is needed for more effective use of sustainability indicators and assessment is: "a cyclical, participatory process of scoping, envisioning, experimenting, and learning through which a shared interpretation of sustainability for a specific context is developed and applied in an integrated manner." Other European projects, like PETUS (2005), INSURE (2007), and SENSOR (2009), designed indicator frameworks and models to substantiate our understanding of the future impacts of our decisions, thus hinging the impact of the work on the assumptions of instrumental use: if "you" forecast the harm, using reliable data and modelling, and a better interface, "they" will make decisions to avert the harm.

In North America, no comparable research trail exists. The North American context also offers a different political opportunity structure for policy impact of indicator systems, compared to that of Europe. This is generally characterized by an absence of legislatively supported national or state/provincial sustainability indicators, and a relative abundance of purpose-built, sectorally and regionally focused systems, largely operating at arm's length from government.[3] By contrast, Rinne et al. (2013, 5) found that

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[1] Additional components to a complete usability analysis offered by Bauler include participation, science and governance (how are assessments conducted, by whom and in what forms of interaction), and focus (what is within/beyond scope). In the initial usability analysis of the systems offered here, these criteria are considered subsidiary to salience, credibility and legitimacy, in overlapping ways.

[2] The usability analysis offered here is preliminary, given that it has not been subject to a deliberative process. Methods employed in this analysis include primary and secondary research, including participant observation in each year of the Vital Signs initiative, in which the author was a research advisor, and of Sustainable Seattle at various points since 2002, in which the author is an interested observer, and three key informant interviews.

[3] This refers to the situation in Canada and the United States. In Mexico, by contrast, a limited top-down approach has been taken to the development of comprehensive sustainability indicator systems (INEGI and INE, 2000).