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Incorporating local sustainability indicators into structures of local governance: a review of the literature

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COVER SHEET

Title: *Incorporating Local Sustainability Indicators into Structures of Local Governance: A Review of the Literature*

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Title: *Incorporating Local Sustainability Indicators into Structures of Local Governance: A Review of the Literature*

Abstract:

Too often studies about Sustainability Indicators (SIs) focus either on the science that goes into indicator development seeking to make them rational and relevant or on the soft impacts like social capital, community empowerment, or capacity building that are outcomes of their use. When attention is turned to what effect they have on policy it is often difficult to discern any link between their use and policy change. This paper seeks to address this problem by consolidating current thinking on indicators and asking the question – *How far have notions of governance been incorporated into current research into indicators?* The answer to this question has implications for the continuing utility of indicators as policy tools, not only in so far as they are able to aide the evaluation of policy, but also, and arguably more importantly, in how they are able to facilitate relationships between actors and act a catalyst around which various contested meanings of sustainability can be evaluated.

Keywords: Sustainability indicators, governance, sustainable development

Article Word Count = 5323

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INTRODUCTION

Sustainability indicators have now been with us almost 20 years, from the publication of *In Search of Indicators of Sustainable Development* (1991), to the launch of Local Agenda 21 (1992) the proliferation of research into the measurement and monitoring of sustainable development has grown exponentially. This growth in information regarding sustainable development indicators (SIs) has led some to describe their popularity as ‘inescapable’ (McAlpine & Birnie 2005) whilst others talk of an “indicator industry” (King et al 2000). Indeed this journal has played a pivotal role in the discourse surrounding SIs by providing an arena for debates and research to be published and co-ordinated. From the classical exchange between Brugman and Pinfield in 1997, which opened up the dialogue on scientific relevance versus local resonance, to two special issues on local sustainability indicators in 1999 and 2003, *Local Environment* has been at the forefront of indicator research. This article seeks to consolidate current thinking on indicators and ask the question – *How far have notions of governance been incorporated into current research into indicators?* The answer to this question has implications for the continuing utility of indicators for policy tools not only in so far as they are able to aide the evaluation of policy but also, and arguably more importantly, in how they are able to facilitate relationships between actors and act a catalyst around which various contested meanings of sustainability can be evaluated. The paper will do this through a review of the literature published between 2005-2008

examining specifically studies on the use and effectiveness of SIs. In doing so, it is hoped that trends in the research can be identified, offering new insights into SI effectiveness.

Before beginning it is important to note that this paper is not an exhaustive literature review explicitly covering every article written on SIs in the above mentioned period, which itself is brief reflecting a desire to present emerging trends within this field of research. Rather, the paper seeks to be selective and schematic in its approach, thereby offering the reader a framework with which to evaluate emerging thinking on SIs. The works summarised here are broken into three broad typologies, which this author believes are unfolding as the dominant discourses within the literature. Each article used represents an excellent illustrative example of the points raised within the these three camps, presenting readers with field-posts and way-markings for further investigation. Whilst there were many other papers that could have been added as examples to each grouping it was felt, that to avoid repetition and to keep to recently published research, it was best to work with a selected set of articles. Where papers published before 2005 are referenced this is done only to establish the lineal roots of each typology.

The primary literature covering SIs written and published between 2005 to 2008 can be broken into three roughly constituted camps. The first of these is dedicated to the discourse of 'sound science' and the building of better indicator systems and indicators through technical advancement. On the whole, work within this genre does not link indicators to specific policy change; rather it discusses decision-making in aspirational tones and pushes for indicator systems that better take into account the nuances and complexities of eco-systems. The second category again harkens back to an older

paradigm of examining the softer qualitative impacts of indicator programmes and focuses more at the community level. Here work often acknowledges the lack of progress indicators have made in respect of specific policy actions and extols the benefits of the softer impacts of capacity building, the production of social capital, and communication that can be gained through indicator programmes. They take this work further by proposing various frameworks that help capture and more predictably create these soft impacts thus bettering local policy making overall. The final strand of the literature moves into newer territory by actually considering the impacts indicators have on decision making and postulating what this tells us about forms of governance. In doing this, these studies offer us something unique through the explicit and tangible links they make between the discourses of sustainability bound up in the creation of indicator systems and the dynamics of governance bound up their use.

Type 1: Building a Better Mousetrap

Much of the early literature on indicator development was typically distilled into rather formulaic notions of good indicator design, which combined a number of factors in order to produce the 'ideal' indicator. So for example, if one were to add together the intended purpose of an indicator with consideration of its desired audience ensuring relevant consultation/participation and an appropriate design, 'good' indicator development could be achieved (see Levett 1998, Holland 1997, Jesinghaus 1999, and Pastille, 2002:11). This technical discourse on indicators was embedded into notions of 'sound science' and technocratic policy making, where the policy process was viewed as linear and indicators were seen as simply an input into that process. Within this

paradigm, checklists regarding the measurability, validity, and transparency of indicators were developed to ensure rational and statistically appropriate tools.

Current literature within this frame also embeds itself into a scientific or ecological discourse with prominent themes relating to the measurement of sustainability via statistical innovation (Tasser et al 2008), barriers to indicator success (Hickey & Innes 2008; Mayer 2008) and an improved understanding of indicator frameworks (Wilson et al 2007; Niemeijer & de Groot 2008a; 2008b; Pulselli et al 2008). Two themes stand out as significant within this discourse and are handled either explicitly or implicitly within the papers summarised here. The first theme is that of complexity the second is the rather ‘aspirational’ role indicators should play in relation to decision making.

Complexity is a theme which runs throughout these articles and typically relates either to the complexity of indicator systems and ways in which technicians can simplify measurements to present to policy makers or the potentially more interesting argument regarding the complexity of ecosystems and indicator systems themselves. A case in point of measurement simplification is presented by Tasser et al’s (2008) study of biodiversity indicators used in the South Tyrol region of northern Italy. Here they found, through using factor analysis, that three dimensions within the indicator sets (naturalness, landscape structure, and species diversity) accounted for more than 76% of the overall variance, leading them to propose that factor analysis could be used to simplify indicator systems “without losing too much information” (p204). Certainly, by reducing seven indicators to three and displaying them graphically as maps using GIS software the authors do make steps forward in terms of presentation of complex information to a lay audience, although this is clearly a method not without risk.

However, whilst the article does discuss the social construction of sustainability (p210) to some extent, its main thrust is improving technical aspects of measurement systems therefore firmly wedding itself to the older paradigm of ‘sound science’.

A more nuanced reading of the complexity thesis belongs to those authors who propose that attention should be focused on the dynamic and intricate nature of ecosystems when investigating and developing indicator systems. Within this frame ecosystems should be seen as “...a set of elements, both natural and anthropic [that] interact, constituting a complex network of relations that cannot be investigated through the elements of the system...being isolated from each other.” (Tiezzi and Bastianoni, 2008:329). What is notable within this description is the acknowledgement of inter-relationships and networks of factors that work together to form the eco-system and the need for a system of measurement that acknowledges these interdependencies. Most of the authors within this frame discuss the importance of using multiple frameworks of evaluation so that issues of scale and network interaction can be explicitly addressed (see here Pulselli et al 2008; Bagliani et al 2008; and Mayer 2008). The authors who present this position most forcefully are Niemeijer and de Groot (2008a; 2008b) in their work looking at moving from the examination of causal chains to the use of causal networks in indicator reporting.

Niemeijer and de Groot (2008a) acknowledge the contributions that have been made in the development of assessment frameworks like Pressure-State-Response, Driving force-State-Response, and Driving force-Pressure-State-Impact-Response in their engagement with notions of causality, however they criticise these for being uni-directional and therefore lacking in a full understanding of complexity (p1). Causal chain frameworks typically work by placing one or more indicators at the beginning of

a chain and one or more at the end to illustrate a relationship in a single field of sustainable development. However, in so doing the inter-relationship between both the fields (e.g. desertification or acidification) and indicators is lost (op cited: 2). The authors comment that these frameworks "...deal poorly with the complexities of the real world (i.e. simplify cause and effect relationships too much) and provide little analytical guidance in the selection of indicators and in the establishment of "control points" for monitoring and management of sustainability." (op cited: 17). Their proposal is a turn away from systems that place emphasis on indicators singly towards one that "...places the indicator set at the heart of the selection process" (Niemeijer and de Groot 2008b: 14). They seek to accomplish this through boundary specification, a clear understanding and definition of the domain to be examined, and crucially an interactive mapping of the indicators used within a directional graph (Op cited: 20). This final stage actually builds a picture of the causal network and allows for better informed decisions to be made regarding the complexities of indicator selection thorough the understanding of interaction amongst the indicators within the network.

The second theme within this section of the literature deals with the aspirational role indicators are to play in the policy making process, with some articles going so far as to use an almost medicalised language in their treatment of indicators discussing "sustainability therapy", "sustainability diagnosis" and "diagnostic instruments" (Teizzi and Bastianoni, 2008: p329). Many of the articles here hold fast to the ideal of indicators as pure technocratic information that will naturally facilitate and feed into policy making. Authors speak of indicators as providing an "...exhaustive and quantitative picture of the complex relationships between society and the environment" that will provide administrators and decision-makers the information they need to direct

policy (Bagliani et al, 2008: p364). Additionally, they discuss the challenges to the creation of a “...scientifically sound, useful, and effective indicator framework that will demonstrate progress” towards sustainability (Hickey and Innes, 2008: p131). The over-riding conceptualisation of indicators within this section of the literature is perhaps best summed up by Moldan and Dahl (2007: p1) when they assert that “...we need information tools that condense and digest information for rapid assimilation while making it possible to explore issues further as needed. This is the goal of indicators”. Here faith is expressed in the scientific nature of indicators and even when this is coupled with participatory approaches (e.g. Hickey and Innes, 2008; Håk et al 2007) or the acknowledgement that due to their complexity many different measurement tools may be needed in order to help decision makers to “...make the ‘best’ decisions and design the ‘best’ policies” (Wilson et al, 2007:p312) the overall message is that indicators themselves are, by virtue of their scientific validity, appropriate tools for feeding information into the policy process.

In order to better understand the aspirational spin put on indicators within this frame it is important to clarify the conceptualisation of the policy process these authors have. Looking again at the work of Moldan and Dahl, **who do attempt to cover concepts of governance in their work**, we see policy spoken of as a “life-cycle” that runs from the acknowledgement of the problem, “to the design of the policy and its implementation, evaluation, and adaptation, and finally to its phasing out or integration into another policy instrument” (2007:p4). Within this policy cycle, they see indicators performing a number of roles feeding information back into the policy life cycle. As stated earlier, the primary problem with this notion of indicators is that it assumes a linear input driven policy process that cannot explain the inherent complexities of

modern governing frameworks, which are not based so much on traditional hierarchy but are formed out of broader networks of actors from both inside and outside government.

Type 2: Its not so much the winning its about taking part

Much of the early work on indicators was firmly grounded in looking at improving them as tools so questions of measurement and clarity were paramount. When the research focus began to shift into the actual measurable effect indicators were having on policy a new wrinkle developed in the debate. This was that it was difficult to make any real linkages between indicator use and policy change (Innes and Booher, 2000). Here the arguments shifted from the effects that indicators had as decision making tools to their benefits on more developmental goals like capacity building, participation, and engagement (Sommer, 2000; Gahin et al, 2003). Writing in 2003, Gahin et al examined five community indicator programmes in the United States and categorised their outcomes into:

- Intangible Benefits – (e.g. forums for discussion, relationship building; increased awareness; shifts in values)
- Concrete Benefits – (e.g. new agendas or programmes; influence on decisions; changed individual behaviour; resource allocation)
- Measurable Benefits – (e.g. “CHANGE! Progress toward sustainability...as measured by the indicators”)

Perhaps not surprisingly they found that the majority of the benefits identified as coming as a results of sustainability indicator programmes fell into the ‘intangible’ category with a few ‘concrete’ benefits shown and no ‘measurable’ benefits whatsoever.

Whilst this may paint a rather bleak picture of the effectiveness of indicators, they stressed that the ‘foundation building’ aspects of the intangible effects of indicator programmes in creating social knowledge, catalysing communities, and opening dialogue should not be ignored simply because these qualities are hard to measure. Current literature within this frame either implicitly or explicitly seeks to build on these ‘intangible’ benefits through the creation of more effective indicators, all the while acknowledging that social impacts of indicator programmes should be captured and built upon to better the policy process.

A series of articles by Reed et al are an excellent case in point, here they explore the convergence between what they term as a ‘reductionist’ approach to indicator development based on expert driven technocratic policy and the softer more community based ‘participatory’ approach (Reed et al 2005, Fraser et al 2006, Reed et al 2006). Through a literature review of a number of indicator programmes ranging from grassland management in the Kalahari to forestry management in Western Canada, they acknowledge that a level of integration between ‘soft’ and ‘hard’ approaches to indicator development brings about the best hope for measuring progress toward sustainable development (IBID). Whilst they note key technical issues in indicator creation and use, like boundary specification and policy relevance, they also detail how an integrationist approach might be better able to facilitate community action and learning (Reed et al, 2005), which they classify as perhaps the most significant benefit of indicator programmes (Fraser et al, 2006: p123). In order to illustrate the importance of convergence Reed et al (2005) revisit Bossel’s (2001) system-based approach and show how this framework for indicator development can be combined with notions of participation so that community visions and goals may be linked to measurable rational

indicators thereby offering a productive way forward for indicator development and community empowerment (Reed et al, 2005).

Joanna Becker, writing in *Local Environment*, presents another framework for indicator development this time loosely based on Capra's 'web of life theory' to define aspects of sustainable development in order that a discussion about indicators can be better framed (2005). In this article, she acknowledges Bell and Morse's (2003) point that whilst the utility of indicators in terms of policy effect may be open to question, they do serve as an excellent learning opportunity for stakeholders (Becker, 2005: 88). Here she goes some way in progressing the thinking on 'soft' or 'intangible' impacts brought about through the educative value and participatory processes of indicator selection. What is important about Becker's work is that she does not simply stop at noting the 'social good' brought about through a better educated and informed citizenry; she actually tries to capitalise on this effect. Becker does this by proposing a framework for indicator development based on ecological terminology to help describe various elements involved in sustainable development thereby providing a structure to guide and progress stakeholder discussions on indicator selection. By doing this, she seeks to firm up the sometimes unfocused discursive processes that go into indicator development, by utilising terminology and principles taken from ecology. By framing discussions around collaboration, auto-sufficiency, and resilience, she believes that the educative value of indicator selection can aid in stakeholder's "understanding of how to *achieve* sustainable development, which is the first step in making progress towards it." (Becker, 2005: p98-99 my emphasis).

Bell and Morse (2005) also propose a framework to capture the learning benefits of Sustainability Indicators. In their study of the Blue Plan in Malta they use the Kolb

Learning Cycle to explore indicator development, and note the beneficial ‘Sustainability Therapy’ an approach like this can have on those who feel “trapped in processes they find orthogonal to their own perceptions” (Bell & Morse 2005: p 50). Here the authors outline the linear nature of sustainability projects and juxtapose this with the circularity of the concept itself. By applying a framework like Kolb’s learning cycle, they illustrate how sustainable development projects can be made more ‘circular’ thus fighting the linearity of these approaches. For example, they comment that one notable outcome of the Blue Plan in Malta “was the joy that the participants showed in learning about sustainable development through SIs” (Bell & Morse, 2005: p. 49). Whilst they acknowledge that learning may not be a key aim of the project donors, they also highlight how SIs and the learning processes that emanate from them can be used to shed light on unequal power relationships and areas of conflict. Further, they assert that through the use of a “learning framework” it is easier to “keep contesting actors together” by providing “them with a platform for fruitful debate (Kasemir et al, 1999 cited in Bell & Morse, 2005: p50). For Bell and Morse, “the learning is the doing” and the framework provides the mechanism by which the linearity of sustainable development projects can be married to the circularity of sustainability as a theory.

While these articles have certainly moved the debate forward in terms of the conceptualisation and capture of ‘soft’ indicator impacts like community empowerment, capacity building, and the educative value of indicators, what they lack is a real engagement with notions of governance and the policy process. Here the research misses out by not explicitly discussing the role that indicators can play in network integration between policy makers, departments and stakeholders both across spatial scales and policy sectors. The next typology deals with these issues in a far more

comprehensive way helping to fill what Hezri and Dovers refer to as a 'lacuna' in current indicator research (2006: p.85).

Type 3: Connecting the dots

Part of the problem we have seen so far with the articles summarised here on indicators is that they either engage with a technocratic discourse on indicator development and therefore provide a rather formulaic 'recipe-book' of how to 'do' sustainable development or they emphasise the 'soft', intangible outcomes of indicator programmes without ever coming to terms with how SIs affect policy or alter governance. In reality, there is a third way in which these programmes can be analysed that could prove far more fruitful in telling us about local governing arrangements and the social construction of sustainability. Shedding light on these issues could, in the long term, help planners and communities better embed sustainability into the policy process. This alternative approach is to take a serious and measured look at how governance is articulated through indicator programmes including issues like the relationships developed through interactions between central and local policy actors and the manner in which the dialogue over the contested nature of sustainable development is produced and reproduced in policy networks. As O'Riordan (2004) comments, both sustainability and governance are fluid and slippery ideas, but as Jordon (2008) rightly notes, it is impossible to avoid this partnership of terms if we are to seek a better understanding of how sustainable development is being operationalised. The next series of articles offer insights into these issues, engaging seriously with notions of governance and the contested nature of sustainability itself.

Alan Terry (2008) provides an interesting starting point for this section in his analysis of a DIFID funded programme, in South Africa which ran from 1998-2001. The *Community Sustainable Development Indicators Project* was part of a larger set of programmes run under UN Habitat that sought to link improving quality of life in the Global South to improving local governance structures. Community led indicator programmes were to be part of the project in Sobantu a black township in Pietermaritzburg, South Africa. In many ways the story Terry tells mirrors the cases detailed above from the initial swell of support for SI development from the local community with the requisite positive ‘soft’ outcomes like capacity building and empowerment, to the ultimate ‘workshop fatigue’ and loss of interest in the indicators, which have stymied their use. So, on the surface, this seems a description like so many others of programmes that began well and then petered out through lack of interest and political will. What Terry offers that is different in his analysis of why this programme failed is an explanation centred on poor relationships between communities and service providers/ local politicians and how these negatively impacted indicator use. Here Terry lays the blame for programme failure not at the door of the local community who did not want to challenge poorly performing politicians, rather he highlights the failings of UK programme managers who, assuaged proper contact and buy-in from local politicians and service providers at the development stage in order to maintain a purely community-led project (2008: p. 232). This failing calls our attention to the importance that relationships of trust and networks built over time can have in creating functional policy environments by aiding connectivity outside the local network that helps to ‘brace’ governing coalitions together offering local actors better opportunities to interact (Holman, 2007; Rydin & Holman 2004). Here, if properly handled, SIs can be seen as

portals that help to open up avenues of dialogue between tiers of government (Journel et al, 2003) and to shape networks more broadly (Alstleithner et al, 2004). This point is also beautifully echoed in the work of Hezri et al (2006) and Hezri (2004) who discuss the case of sustainable development policy integration in Malaysia. Whilst they do not find an overly positive picture of this process, they do highlight that SIs have played an experimental role in fledgling developments into horizontal policy integration by helping to shape institutional arrangements (Hezri et al, 2006; Hezri, 2004).

Going back to the work of Terry (2008), he also makes a potentially even more interesting observation about the affect indicators can have on local governing arrangements especially in terms of the mediation of relationships between the central and local levels of government. He does this, not through his analysis of why the SIs failed in the Sobantu case, but in his prediction of why these locally chosen indicators may regain their importance under the new planning framework South Africa has adopted. Here the passage of the *Local Government Municipal Systems Act* comes into play. This Act calls for the development and adoption of municipal Integrated Development Plans, which must take into account community participation in the administration, budgeting and management of local areas. In effect this act, in neo-Foucauldian terms, will help to 'responsibilise' local governments in much the same way municipalities in the Global North find themselves monitored and measured through governmental technologies designed to gauge their performance (See for example Vincent-Jones 2002; Rydin 2007). Indicators here play a role in this mediation but can also act as sites of local resistance so, as Rydin rightly notes, any use of the governmentality framework must allow for a proper consideration of agency and

conflict in the construction of objects (like sustainable development) and their subjects (in this case communities and local governments) (2007: p.621).

Two other articles falling into this category also offer some intriguing insights into how SIs can be used to alter and strengthen local governing arrangements all the while providing a platform upon which the contested nature of sustainable development can be discussed. Holden (2006) provides an interesting account of the history of the Sustainable Seattle programmes from their inception in the early 1990s through four clearly defined iterations of projects until 2006. In this article she challenges the dominant view that the impact of Sustainable Seattle was felt mostly greatly outside the local area or as she puts it received wisdom dictates that "...the farther one sits from Seattle, the more likely one is to consider (it) an influential project" (IBID: p.254). She does this by carefully tracing the history of each phase of the indicator project carried out in Seattle and explaining how these all have added to the acceptance and institutionalisation of sustainable development in the city. Here Holden proposes a sort of network that forms over time between projects and the actors involved in those projects creating "direct and indirect ties from (Sustainable Seattle) to (the) newer indicator projects, (which) constitute the local legacy..." (2006: p.266). In many ways this reflects Sirianni's findings on the collaborative governing culture that arose in Seattle over this same period (Sirianni, 2007). The important thing to take away from this experience is the role indicators have played in "starting the conversation" between layers of government and other actors and their role in embedding sustainability into the policy culture (Holden, 2006: p.268). This again reflects the portal metaphor, where SIs act as a door to opening communication between actors and creating new linkages and networks between them. This goes beyond the capacity building ideas prevalent within

the *type two* literature by specifically illustrating how the SIs have impacted on and shaped local governing arrangements over time.

Keirstead and Leach (2007), offer a different take on the network concept by suggesting what they call a service niche approach to SI use and development. In this manner, they propose to target indicator programmes at specific urban services like energy, transport, waste and water that are already goal-driven and target oriented where clear policy synergies between service delivery and sustainability exist (IBID). By doing this they surmise that some of the ambiguity and over-ambitiousness most often associated with sustainability can be avoided. This problem of uncertainty was also highlighted by Hajer and Versteeg (2005) in their work on discourse and environmental politics. Here they note that “environmental debates often take place in a situation of institutional ambiguity, in which there are no generally accepted rules and norms according to which policy is to be conducted and policy measures are to be agreed upon” (IBID: p.182). By adopting a service niche approach to indicator development Keirstead and Leach conclude that not only will policy ambivalence be avoided through a more structured and directed approach to SIs, more importantly they believe “if carefully picked to ensure relevance to these wider debates, the experience gained in these small indicator niches might then provide a *stepping-stone* to more elaborate evaluations of urban sustainability” (IBID: Published on-line my emphasis). The direction then, is a network approach to embedding sustainability whereby environmental discussion within specific departments leads to the creation of modes of working, rules, and concepts alongside a “...thickening or discarding of meanings” about sustainability that can then be dispersed more broadly (Hajer & Versteeg, 2005: p. 176). Again, the articulation here is scalar, building linkages across departments and

embedding the concept of sustainability more widely with SIs acting as portals for this process.

Concluding Remarks

The question that opened this article was - *How far have notions of governance been incorporated into current research into indicators?* Through the examination of a selected set of recent articles on SIs this paper has found that although progress is being made regarding measurement, the conceptualisation of complexity, and the capture of 'soft' indicator impact in two of the camps, an explicit understanding of governance is still missing the research. In the third typology, *connecting the dots*, the linkages between indicator use and the effects this has on shaping governing arrangements is much more apparent. Miller in his 2005 article comparing five projects designed to develop and use sustainability indicators makes a compelling argument here. He states that SIs are "important new experiments in governance" that may be transformational not only to our identities as planners, politicians, or communities but also to the relationships that are shaped between us (p. 405). This is a good starting point for our conclusions as it opens out debates about what we as planners and academics can take away from these discussions and use in our professional lives.

The first lesson here is that sustainability is socially constructed and essentially this makes it a messy and muddy field of play. Jordon (2008) points to a quote by Donaella Meadows, the author of *The Limits of Growth* that reflects this notion brilliantly; she observed that the debate about what constituted sustainable development was a "mess" but she also pointed out that any "great social transformation" was by its very nature messy (p.28). So, here, indicators play their role in developing and constructing what it means to 'do' sustainability; they help us to frame our discussion.

They act as “key site(s) of innovation in which people are working out new conceptual models of nature and society” (Miller, 2005: p.405). Given this perhaps, the service niche approach proposed by Keirstead and Leach (2007) does offer a useful tool for creating boundaries and parameters around which the social construction of sustainability can take place. However, it is also very important to note that other studies (e.g. Holden, 2006) have shown that indicator programmes can help to construct meaningful dialogues about sustainability that do become embedded institutionally over time despite a lack of strict boundary specification. The core factor here is that we must enter into these discussions with open eyes, understanding that they are messy but also realising over time that notions of sustainable development can become embedded into the governing culture. We do, however, have to play our part in guiding and shaping the discourse.

This institutional embedding opens up the second and perhaps most important point that is raised in this literature review. That is that there are explicit linkages bound up in the discourses of sustainability that come out of the creation of SIs and the dynamics of governance tied to their use. In many respects indicators here act as portals of communication that create the need for cross departmental, cross community, cross party discussion and thereby “shape networks” (Alstleithner et al, 2004). It is here in this shaping of networks that studies in the third camp move beyond ‘soft’ impacts and into conceptualisations of governance. Moreover through this continual discussion, framing, and re-framing of sustainability brought about by their use the concept itself becomes commonplace and normalised. In this context, SIs are not being used as a technology of command and control or accountability, rather they function as a technology of visibility making various aspects of sustainable development more

eminent (Miller, 2005: p.425). Thus the key concept for planners and other urban professionals is to recognise and act upon opportunities to open dialogues with groups centred on SIs. By forging new relationships we create new opportunities for trust and networks to emerge; it is only through the extension and strengthening of these networks of trust that dynamic and healthy policy communities can emerge.

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