Making Sustainability Operational;

Coping with Contextual Circumstances

Umaporn Pupphachai, MSc.[1]**,** Dr. Christian Zuidema[2]

Abstract

Sustainability became popular through Brundtland Commission's report published in 1987 and has subsequently been introduced as a key planning guideline in urban governance. To make the abstract and fuzzy notion of sustainability palpable, various governments are using a list of Sustainability Indicators (SIs). Common sets of Sis, for example those form the UN, help compare the sustainability of urban areas all over the world, whilst they inspire the development of national and local initiatives to measure and monitor sustainable performance. Using SIs should, however, not be isolated from the different geographical, socio-economic, political and institutional circumstances that exist in various towns and cities. Instead, in this paper we argue that for SIs to be well integrated in the local policy process, SIs should be adapted to different contextual circumstances. We discuss this argument based on a desk study of key policy documents and research reports on cases in four clearly different regions: the UK (London), China (Hong Kong), South Africa (Johannesburg) and Singapore. One the one hand, we will explain that sustainability is indeed defined differently in different contexts and, also, that it makes sense to do so as priorities and contextual circumstances do matter for integrating Sis in local governance. Hence, indicators should also be tailored to the existing policies and local policy priorities so as to function as a bridge between various disciplines both within urban governments and between governments and non-governmental stakeholders. Secondly though, we will also explain that improving the fit between SIs and existing policies and local policy priorities does not discard the importance of a common set of SIs. To avoid skewing definitions of sustainability to whatever 'fits' in a local context, we will argue that a common set of SIs can function as a benchmark for reflecting on existing sustainability plans and policies and, as such, inspire innovation. We will thus conclude that making sustainability operational is a two way process of using a common set of generic principles and of adapting them to local circumstances, which should be reflected in the design and use of SIs.

---

[1] Department of Planning, University of Groningen, The Netherlands, u.pupphachai@rug.nl
[2] Department of Planning, University of Groningen, The Netherlands, c.zuidema@rug.nl

1. Introduction

At the beginning of the 21^{st} century the world is faced with the tremendous challenge to pursue a transition towards sustainable development. It is a challenge that was brought to the forefront of the political and social debates by the 1987 Brundtland Commission. During the 1990s many governments on all levels of authority responded by starting to experiment with new policies and instruments to translate sustainable development ambitions into practical plans and programmes (e.g. Miller & De Roo 2000, O'Riordan & Voisey 1998, Selman 1996). Also at the local level, sustainable development gradually got cited as an ultimate urban planning tool (Briassoulis 1999). Nowadays, sustainable development is a common part of the policies and plans in towns and cities throughout the world. Nevertheless, sustainable development lacks a clear definition and no universal consensus has yet emerged upon how best to make sustainable development operational. Implementing sustainable development and translating it into policies that make a real impact on the ground is therefore still one of the main challenges of our time, also when it comes to urban planning.

One of the prime means used to both operationalize and measure sustainable development is the use of sustainability indicators (SIs). The importance of SIs for advancing sustainable development was already highlighted by the United Nations Conference on Environment and Development in 1992. Various governments all over the world subsequently started using SIs, showing that SIs could be very useful for quantifying change, for identifying problems and also, for providing governments with a framework for setting targets and monitoring performance. Many governments were inspired by the pioneering work of the United Nations. In 1995 the United Nations Commission on Sustainable Development presented a first draft framework of 134 common SIs, which after testing was eventually adopted in 2001 (UN 2001). Although the common set of indicators issued by the UN created awareness of the value and importance of SIs, it was also noted that we should not expect the emergence of a universal set of indicators that is equally applicable to all localities (e.g. Dhakal & Imura, 2003). Rather, the relevance of different SIs depends on the contextual circumstances, such as socio-economic, geographical, cultural and political circumstances and priorities. This is especially prompt when it comes to the use of SIs in a local realm, where unique local circumstances often have a major impact on both the causes and effects of the problems to address and on the policy objectives that are prioritized.

In this paper we address the role of SIs in assisting local governance for sustainable development. We begin by explaining why sustainable development is so hard to make operational and address how SIs might be of assistance in doing so. On the one hand, we will argue that SIs need to be well integrated in the local policy process and should be adapted to different contextual circumstances. On the other hand, we will also argue that improving the fit between SIs and existing policies and local policy priorities does not discard the importance of a common set of SIs. To avoid skewing definitions of sustainability to whatever 'fits' in a local context, we will argue that such a common set can function as a benchmark for reflecting on existing sustainability plans and policies and, as such, inspire innovation. To support our argument, we conducted a research on the use of SIs in cases in four clearly different regions: the UK (London), China (Hong Kong), South Africa (Johannesburg) and Singapore. In this paper we report on the first phase of our research, which was largely explorative so as to assess whether cities indeed use SIs in accordance with our idea of a 'two way process', or, whether this might add value to the use of SIs in these cities. Hence, our study is mainly meant to be illustrative and to indicate whether subsequent research is needed to further substantiate our argument. We will report on the results in sections four and five, where we discuss whether and how SIs can help make sustainable development operational without causing undesired biases. The conclusions of our research are presented in section six, where we also explain how these conclusions can be used for improving the role of SIs as an appropriate tool for local authorities.

2. Delivering Sustainable Development

Sustainable development is a fairly recent concept that evolved during the past four to five decades. It largely emerged out of an ecological sustainability concern during the 1960s and 1970s (e.g. Baker 1997), such as revealed in the report 'Limits to Growth' by the 'Club of Rome' (Meadows et al. 1972). Gradually, this idea of ecological sustainability was confronted with ideas that some degree of economic growth and especially, social development is needed next to sound ecological and environmental management (e.g. Beder 2006). Eventually, sustainable development emerged as a compromise that seeks to combine three key objectives; i.e. economic growth, social welfare and environmental quality (also see Connely 2007, Jordan 2008).

Commitment to sustainable development gained momentum after the publication of the 1987 report 'Our Common Future' (Brundtland 1987), which defined sustainable development as "development, which meets the needs of the present without compromising the ability of future generations to meet their own needs" (1987; p. 43). Its rhetoric power became visible in the widespread use of sustainable development in policy documents on all levels of authority and in all regions of the world. Nevertheless, more than two decades since its rise as a general policy guideline, our current world society is arguably still far removed from a condition of sustainability. Rather, we face ongoing unsustainable trends in relation to for example climate change and energy use, environmental threats to public health, poverty and social exclusion, poor management of natural resources, biodiversity loss, etc. (for discussions see Global Footprint Network 2010). It is illustrative of the difficulties of putting sustainable development into practice. Indeed, popular initiatives such as Local Agenda 21 and the EU Sustainable Cities Campaign often only met limited successes (e.g. CEC 2004, EEB 2006).

Disappointing results in practice have led to criticism on sustainable development and, especially, its rather vague and abstract nature. In being a compromise, sustainable development remains a fairly abstract concept. This abstract nature does make sustainable development an attractive concept as it is hard to ‘oppose’ to it. After all, in remaining rather abstract and vague, conflicts are avoided regarding the exact choices between economic, social and environmental interests and objectives (e.g. De Roo & Porter 2007, Mitlin & Satterthwaite 1996). Remaining abstract and vague can, however, also be regarded a drawback, which Richardson makes clear when he considers sustainable development “a political fudge: a convenient form of words, promoted, though not invented, by the Brundtland Commission, which is sufficiently vague to allow conflicting parties, factions and interests to adhere to it without losing credibility” (1997; 43). The abstract notion of sustainable development only covers a basic and mutually accepted ‘core of understanding’ (also Creedy & Zuidema 2012). Once this core gets taken apart, a whole array of different interests and interpretations gets uncovered (e.g. Campbell 1996, Connelly 2004, Richardson 1997, Rydin 1997). The result is that struggles emerge between parties concerning what sustainable development actually means..

2.1 Sensitivity to local conditions

Over the years, none of the many hundreds of attempts to redefine sustainable development have resulted in more operational clarity regarding how to put sustainable development to practice. Instead of searching for better or more detailed definitions, many authors nowadays suggest that sustainable development can best be given meaning in direct relation to its specific context (i.e. social, political, environmental etc.) in which the concept is discussed (also see Baker et al. 1997, Connely 2007). After all, as Selman explains, “the local ‘patch’ is the crucial arena in which progress towards sustainability must be made. It is where conflicts arise, attitudes are changed and actions are instigated” (Selman 1996; p.3). Consequently, Kemp et al. (2005; p.15) conclude that “what is most needed, appropriate and workable always depends heavily on the context. One could say that sustainability is about locally suited options that are globally sustainable. But it is also about local awareness and behavior that shares the larger agenda”.

In response, Rydin explains that “the notion of top-down implementation of a sustainable development strategy at the urban level is inappropriate” (1997; 153). Instead she calls for debate on a local scale where interactive processes based on (following Lindblom) ‘mutual adjustment’ can result in linking sustainability to the “distinctive characteristics of the local area, (…) [and] the ambiguities of local policy to sustainable development” (1997; p.154). So instead of making sustainability more concrete through a more detailed definition (i.e. uncovering a ‘second layer’ of conflicting interpretations and interests), the concept gets more substance through connecting its abstract claims to the specific context (also see Healey 2007). It is based on the idea that “the social, economic and political contexts are very much local in nature” (Dhakal & Imura 2003; p.116). Clearly, then, this context is not just made up of specific spatial or environmental circumstances. It involves the local policy network, society and related objectives and interest as well. Discussing sustainability in its local context therefore also involves the integration of different interests and objectives. Within government this can result in cooperation between different policy fields. This can, however, also involve deliberative processes in which both governmental and non-governmental bring their specific interests, knowledge and means to the table. As both these processes involve the typical local policy networks, the outcomes will ideally constitute solutions to local issues as well. In this they can be considered typically area-specific solutions to local problems.

2.2 Can indicators help?

While struggling to implement sustainable development, many academics and practitioners have put their hopes in the development of SIs to make sustainable development more tangible. The 1992 United Nations Conference on Environment and Development in Rio de Janeiro was the start of a worldwide effort to promote the use of SIs. In 1995, the Commission on Sustainable Development (CSD) was established, which meant to make SIs more accessible to decision-makers. This was further emphasized during the 2002 World Summit on Sustainable Development in Johannesburg, which showed that SIs had become key instruments for measuring and inspiring sustainable development policies at all levels of government from the international down to the local (The Pastille Consortium 2002)

As Rydin et al. (2003) also note, the early days of developing SIs was largely a ‘technical’ endeavour, focused on measuring aspects and degrees of sustainability. To some degree, it resembled efforts to (re)define sustainable development by identifying a set of criteria to be measured. As Rydin et al. (2003) discuss, this work largely failed to assess links between SIs and the actual process of planning and policy making. In response, later academic and practical work in SIs was more focused on integrating SIs with planning and policy making processes (also see Dhakal and Imura 2003, The Pastille Consortium 2002, and Shen et al. 2011). Often, SIs are meant to play a role in all stages of policy cycle, which include policy making, implementation, evaluation, learning and policy adjustment. SIs are then not meant to be a stand-alone policy effort, but instead, should be well connected to local policies. Indeed, the final report of the Pastille Consortium (2002) also indicates that “creating successful indicators relies far more on focusing on how they are integrated into the processes of urban governance and far less of devising, designing, and tuning particular indicator sets”.

Integrating SIs with planning and policy making processes does have some important consequences. Rydin et al. (2003) identify three interrelated consequences of doing so that we will also address here. The first follows the idea that implementing sustainable development should be sensitive to local contextual circumstances. As Dhakal and Imura (2003) also show, SIs should therefore be related to their local contexts where they can developed and combined given the relevant local priorities and circumstances. Recent literature on SIs also clearly embraced the idea that SIs should be tailor-made to local contextual circumstances. Consequently, it is now increasingly accepted that “there is no universal set of indicators equally applicable to all those places. Economic, social, natural and political situations, and the priorities/values based on these situations vary considerably from place to place, which would mean a common set of indicators would have difficulty in addressing the sustainability issues without many compromises in each place” (Dhakal and Imura 2003; 116). In response, indicators at local level have in more recent years also been designed to show the result of local action on sustainability issues (The Pastille Consortium, 2002). Increasingly, then, the local is the level where the application of sustainability indicators can be best appreciated and compared (Shen et al. 2011). After all, as Salvaris notes, “community indicators and benchmarks are necessarily context-specific” and hence, “need to derive their own indicators of progress to assist local decision-making” (2000; 7, also see Rogers and Ryan 2001).

The second consequence Rydin et al. (2003) identify is that integrating SIs with processes of planning and policy making, highlights the role of SIs in communication. If well designed, SIs has the potential to bridge gaps between laymen and experts, between community representatives and policy officers, between policy practitioner and technician, and between consultant and academic. Consequently, SIs becomes the instrument that can help to bring multiple actors and perspectives together. This cannot only expand the local capacity to govern, but it also shows how SIs can help to develop and adjust existing policies in a more collaborative process. This also directly brings us to the third consequence.

The third consequence that Rydin et al. (2003) identify is closely related to the first two. It follows the idea that an indicator is more than just measuring tool of sustainability. Instead, the process of devising and using indicators fuels and is based on debates and conflicts over what constitutes sustainable development. In other words, developing locally relevant SIs is a means to allow stakeholders with conflicting interpretations and interests to mutually ‘make sense’ of what they consider as sustainable development in their localities. In other words, developing SIs forces local actors to translate the abstract notion of sustainable development into locally meaningful indicators by respecting local issues and priorities and are influenced by multiple actors with their own interests and resources.

2.3 A two way process?

Linking SIs to the local process of policy making and planning highlights the importance of making SIs tailor made to local circumstances, including local stakeholders, their interests and perceptions and locally relevant issues and priorities. While this has important benefits for making sustainable development meaningful in different local contexts, it also holds a risk. After all, as Shen et al. (2011) show, each local practice has its own drivers and goals for developing indicators. Consequently, different local practices focus to a different degree on the dimensions they connect to sustainable development: environmental, economic, social and governance. It follows the idea that each town and city is different in terms of the economic situation, geography, culture, social values, influencing its specific local policy priorities. The study of Dhakal and Imura (2003), for example, shows that developed countries tend to be more interested in the notion of the eco-city, a recycling based society, the reduction of consumption and the changing of life styles, while developing countries are still struggling with basic sanitary needs and public health issues. When taken into its extremes, biases in policies can be such that cities no longer focus on a balanced effort to promote economic development, social welfare and environmental quality, but instead, focus rather solely on only one or two of these. When adjusting SIs to local circumstances, there is thus a risk that they will merely reflect these different biases in monitoring performance and inspiring policy development and hence, reinforce the status quo.

We argue that SIs should be designed in such a way that they can help to reflect on existing local policies and prevent a strong bias to only one or two dimensions of sustainable development. To do so, we argue for a combination of using a set of common or generic SIs, often inspired top-down by for example the UN or national governments, and adjusting these to the local specific circumstances. It indeed allows for a process of ‘mutual adjustment’ between common or generic SIs and local circumstances. Ideally, this will be an ongoing and iterative process of constantly improving and expanding existing policies, inspired by a common set of indicators. SIs can now function as a benchmark for reflecting on existing sustainability plans and policies and, as such, inspire innovation and avoid the skewing of definitions of sustainability to whatever ‘fits’ in a local context.

In the next section we will continue by reflecting on four cases where SIs have been developed and used in the past decades. Our ambition is to first address the contents of the SIs used and to assess the kind of bias that exists in relation to different local circumstances. We will subsequently reflect on how SIs are integrated into policy process and will critically assess missing gaps in SIs and sustainable development policies in these localities. In doing so, we will explain how SIs are used to inspire improvements in sustainable development policies and, possibly, to highlight missing gaps in these policies.

3. Four cases

In selecting cities we looked at both cities that currently work with extensive SD plans and SIs, which are written and presented in English and have clearly different problems, priority issues and policy objectives. We therefore chose to select cities in different regions with quite serious differences in their geographical, political, social and economic backgrounds.

The first city is London, which is world-leading financial centre with the largest GDP in Europe. Key issues are social in nature. A rising number of high-income residents are contrasted by an also large group of low-income groups and unemployed residents (GLA, 2011). As a result, the incidence of poverty has increased and the polarization is associated with a range of social problems such as ill health, substance abuse and crime. In addition, almost 30 percent of London's population belongs to a black, Asian or minority ethnic (BAME) groups that are typically among the least prosperous.

The next two cities are the Asian city-states of Hong Kong and Singapore. The problems that these cities have in common are an escalating overcrowding, scarcity of land, an intensification of land-use activities and the absence of raw materials and natural resources. Hong Kong was developed as a British colony and became a Special Administrative Region of the People's Republic of China (PRC) in 1997. Over 150 years of colonial rule caused a westernized society and a unique social-economic structure. The population in Hong Kong is mainly of Chinese origin, but their manners, behaviour, mentality, and even work attitude are different from the Mainlanders. Hong Kong balances a modernized way of life with traditional Chinese practices. In terms of economics, Hong Kong is one of the key financial centres of Asia, which is also associated with its rather open market and western-style society (HKPDR, 2007). Singapore has many similarities in also being highly urbanized and a key economic hub in Asia. Unlike Hong Kong that sets its goal to be an Asia's world city with good quality of life and wealthy economy, Singapore pays much attention to reserve environmental resources and calls their plan the 'Green Plan' (MEWR, 2006).

The last city is Johannesburg, a capital of South Africa where the low level of education and income inequality are major concerns. Johannesburg is one of the most progressive commercial cities on the African continent and attracts many migrants seeking economic opportunities, access to services, political safety and shelter (COJ, 2011). The city subsequently has becomes a multi-cultural city, with a rich diversity as the migration brings cultural, political and social plurality, both creating opportunities and challenges to an already-stretched resource pool.

Table 1: Key policy documents and their focus in the cities studied

	London (UK)	**Hong Kong (China)**	**Singapore**	**Johannesburg (South Africa)**
Area (sq.km.)	1,572	1,095	710	1,644
Population	7,825,200	6,900,000	5,183,700	3,888,180
Density per sq.km.	4,978	6,301	7,315	2,400
Program name	London Plan 2011; Spatial Development Strategy for Greater London, 2011	Hong Kong 2030; (HK2030 study)	Singapore Sustainable Blueprint (SSB)	Joburg(GDS) 2040; (Joburg 2040); The Johannesburg's Growth and Development Strategy 2040
Main actor	Greater London Authority GLA	Hong Kong Government	Inter-Ministerial Committee on Sustainable Development IMCSD	City of Johannesburg

Start Planning	1999	Start in 1997	Start in 2008 (Supersede the SGP2012 started in 1992)	2000
Launched Plan	1st edition in 2004 2nd edition in 2008 3rd edition in 2011	1st edition in 2005 2nd edition in 2007	1st edition in 2009	1st edition in 2006 2nd edition in 2011
Duration	20 years (2030)	30 years (2030)	20 years (2030)	30 years (2040)
Update monitoring	Annual	Annual	Annual	Annual
Vision	Making London the best big city in the world *from Mayor of London, Boris Johnson	Asia's world city	To make Singapore a livable and lively city state, one that Singaporeans love and are proud to call home	A World Class African City
Focus Area / Objectives	-Meets the challenges of economic and population growth -An internationally competitive and successful city -A city of diverse, strong, secure and accessible neighborhoods -A city that delights the senses -A city that becomes a world leader in improving the environment -A city where it is easy, safe and convenient for everyone to access jobs, opportunities and facilities	-The desired living environment -The national dimension -The changing economy -Population dynamics	-Improve resource efficiency in water, waste and energy, -Maintain a clean environment with good air quality, green and blue spaces -Effective public transport	-Eradicating poverty -Building and growing and inclusive economy -Building sustainable human settlements -Ensuring resource security and environmental sustainability -Achieving social inclusion through support and enablement -Promoting good governance

As our ambition was to address our cases so as to assess whether cities indeed use SIs in accordance with our idea of a 'two way process', or, whether this might add value to the use of SIs in these cities. Our study was therefore largely explorative and based on an extensive desk-study of key policy documents. It was focused on the use of strategic policy documents, documents conveying the choice of indicators and the ambition levels connected to them and, finally, the links between these (also see Table 1). In addition, our desk-study was supported by several academic studies closely linked to our interests (Dhakal and Imura 2003, Hezri 2004 and Shen et al. 2011). Our first question was to assess how these circumstances affected the use and development of SIs, which we will report on in section 4. Our second question was to assess whether SIs, possibly based on existing common sets of SIs, function as a benchmark for reflecting on existing sustainability plans and policies and, while doing so, also stimulate policy innovation. We will address this question in section 5, where we thus reflect on the use of SIs in addressing missing gaps, both regarding the contents of the indicators and the existing governance capacity and instruments.

4. Local circumstances and the tailor-made Sis

4.1 Priorities and indicators

Differences in local circumstances are first of all reflected in different priority issues that cities identify. These priority issues have also influenced the choice and use of SIs, most notably in several specifically designed indicators that cities use. Examples can be found in all the cities studied. To begin with, the Greater London Authority uses two SIs that directly follow from the high degree of social inequality between different social groups in London. The first indicator refers to inequalities related to health and measures the inequalities in life expectancy between those living in the most and least deprived areas of London. The second indicator addresses whether London is successful in reducing the employment rate gap between both BAME groups and the white population. As such, it measures whether there are increased employment opportunities for those who are suffering from disadvantages in the employment market. A final example from London is the choice to measure 'fuel poverty', which is related to increase travelling by car from house to work and (LSDC, 2009).

Hong Kong is a good example of a city facing rather specific problems, fuelled by its physical geography, climate and extreme (population) density. The SARS epidemic in 2003 was the motive for Hong Kong to pay more attention to health-conscious living environment. This is reflected in indicators that measure the effects of development layout and building design on air circulation and pollutant dissipation. In addition, it specifically measures issues such as public satisfaction of the cleanliness, the living space per person. In the meantime, both Hong Kong and Singapore face a strong scarcity of land and the absence of raw materials and natural resources. This is also reflected in the cities policies and choice of SIs. Singapore designed policies to make optimum use of the available land and, more specifically, to increase green space per habitant and to increase greenery in high-rise building. It also focuses specifically on an intelligent use of energy and water. Each of these topics is directly reflected in its key indicators as these issues are given a high degree of priority. In Hong Kong, similar policies exist. It therefore also specifically measures the consumption of energy per unit of output and the percentage of population living in districts with a shortfall of open space and/or recreation facilities.

Policies in Johannesburg specifically focus on issues related to migration into the city, poverty, access to food and jobs and poor levels of public health and low life expectancy. Hence, their indicators indeed focus specifically on the existing poverty rate, HIV prevalence, social cohesion, levels of literacy and a food security and public safety index. Related to issues such as poverty and an increased population size, Johannesburg also prioritises economic growth. Currently, though, Johannesburg does face a strong, but also unequal economic growth. It therefore aims for a more resilient economy, which is reflected in specifically created indicators measuring whether the city has a job-intensive economic growth, sees a growth of the desired small businesses and an the increased competitiveness of its economy.

4.2 Bias or balance?

Differences in local circumstances are also reflected in the degree in which cities focus on the three main dimensions of sustainable development (economy, social, and environment). On the one hand, this can be seen when assessing the number of indicators that cities use on each of these dimensions. London clearly has a focus on social issues and environmental sustainability. Out of its 24 key performance indicators, only 3 address economic growth and development. Social issues are better represented, with 8 indicators, while most indicators (13) are focussed on environmental issues. In Hong Kong and Singapore a similar situation can be witnessed, as they focus mainly on environmental issues. Hong Kong has 21 out of 27 while Singapore has 41 from 46 environmental indicators and the rest of the indicators are on social issues. Johannesburg is clearly different; the three dimensions are almost equally taken into account. Out of 24 indicators, there are 5 in social, 6 economic, 9 environmental. Interestingly, the remaining 4 indicators are directly linked to measure the quality of its governance capacity.

On the other hand, the number of indicators on the three dimensions need not say much. It is also important to look at the ambitions levels reflected in these indicators; i.e. what is measured? In doing so, some important differences can again be witnessed. Good examples can be found when addressing environmental issues. London for example aims at encouraging the use of public transport and a decreased use of the private car. Johannesburg is not that far yet. It does aim for developing a mass transit system. In the meantime, it however also aims for eco-mobility (non-motorized transport such as walking, cycling and light electric vehicles), which is also directly measured. In term of natural resources, Singapore and Hong Kong concentrate on resource efficiency. Especially for Singapore, a lack of water resources is a main issues, reflected in indicators that show whether Singapore can ensure adequate water supply for future generations; e.g. by reducing water consumption. Additionally, Hong Kong focuses strongly on issues related to health and hygiene, while London tries to take things a few steps further by focusing on reducing its ecological footprint. When it comes to social issues, the contrast between Johannesburg and London is again a striking example. Johannesburg focuses on issues such as food supply, literacy, HIV and on lifelong learning and increasing practical skills of its citizens. In London the focus is on increasing equality regarding health and job accessibility and on issues such as increasing new affordable homes.

5. Linking Sis to policy innovation

5.1 SIs in the local policy process

A strong integration of SIs into the local policy process has important benefits for both developing new policies and improving the existing set of SIs. First of all, it allows for improving existing policies or the development of new policies based on measuring degrees of success or failure by using SIs. Secondly, results from monitoring and measuring can also help to continuously update the set of SIs. They can be (re)calibrated to become more effective or efficient in measuring those aspects considered most relevant, while new indicators can be developed to measure the effects of new policies. Ideally, then, a progressive learning process can be created where SIs are constantly improved and help to fuel the development of new or more effective policies.

Our case studies indeed show how SIs are well linked to existing policies and, in doing so, help to fuel policy innovation. They are most telling in the cases of Hong Kong and London. In Hong Kong SIs are indeed explicitly designed to serve as a support-tool in the policy-making process. In the HK2030 study, Hong Kong used a so called sustainability assessment (SA), which is built upon eight guiding principles and a total of 42 indicators that align with the principles. It is supported by a computer-aided sustainability evaluation tool (CASET) that guides users to complete the SA process through a structured and step-by-step framework. The system comprises a set of baseline data for the indicators and supporting maps to assist users in the assessment process (SDU, 2006). The SDU is committed to keep the SA system and the CASET effective and up-to-date. For instance, the data updating in July 2005, they have taken the opportunity to add a new indicator on landscape value as recommended in Planning Department's consultancy study on 'Landscape Value Mapping of Hong Kong'. The indicators are now used to revise the existing policy and adjust the future one.

In London we also find examples where indicators are altered based on progressive learning. The London Annual Monitoring Report (AMR) shows several changes in the key performance indicators (KPIs) used in 2010 and 2011. The KPIs that are considered ineffective were ejected and a new set was developed. The link of the KPIs to the policy process is also made explicit, by the so-called London Development Database (LDD). It is a live system monitoring planning permission and completion, which provides good quality and comprehensive data. It allows both the development and implementation of London's plans and policies in accordance to the KPIs.

5.2 Identifying gaps

Integrating SIs into the local policy process runs the risk of updating and improving policies and indictors in a process of mutual adjustment that further increases a bias into one or two of the dimensions of sustainable development. To prevent such a bias, we have argued for a mutual adjustment to occur also between local SIs and common sustainable development principles and indicators. Our study revealed that most cities gave no explicit means to do so, although especially Singapore and Hong Kong have implicitly done so.

To begin with, the Singapore Green Plan (SGP) was inspired by the result of a preliminary study commissioned by the World Economic Forum (WEF) in late 2000, which rated Singapore among the worst 10 in a ranking of the environmental sustainability of 122 countries. Its poor ranking on the World Economic Forum inspired the 2002 SGP to promote their vision on 'green and clean'. Consequently, the targets indicators in the SGP were mostly linked to the urban environment dimension, with some on social welfare and none on economic development. Links between these three main dimensions of sustainable development were therefore largely missing. More recently, Singapore has updated its plans and has issued Singapore Sustainable Blueprint (SSB). The SSB does try to link economic growth with pursuing a good living environment. Following the SBB, new indicators have been developed and also reflect the need to combine environmental quality with economic issues. For example, one of the key priorities is to improve resource efficiency, so the cost is reduced, helping economic growth in the long run.

Another good example is Hong Kong; the guiding principles of SUSDEV21 were based on its use of Local Agenda 21 policies. The Local Agenda 21 process was conducted in Hong Kong and highlighted that 13 of the 27 guiding principles were of high relevance for Hong Kong to address: i.e. economy, health and hygiene, natural resources, social, biodiversity, cultural vibrancy, environmental quality and mobility. These key principles have subsequently been translated into a set of performance indicators, taking the local contexts into account. In the meantime, the latest Hong Kong plan, the HK2030, has taken the recommendations of the Commission on Strategic Development into account, which was re-affirmed by the community through public consultations. It allowed for the development of the new future road map, focussed on three broad and interlocking planning directions: providing a quality of living environment, enhancing economic competitiveness and strengthening links with the mainland (HKPDR, 2007).

Finally, the example of Johannesburg also shows evidence of altering policies so as to prevent biases. The first GDS plan (Joburg 2030) was developed to stimulate economic growth and competitiveness. The main purpose was to compensate economic growth imperatives with a focus on pro-poor interventions, to reduce poverty. In the new Joburg 2040 plan, the main intention has been somewhat changed and now also focuses on the context of climate change and natural resources scarcity, which are also reflected in its use of SIs. Importantly, though, it seems that this innovation is less based on the existing set of SIs, but more on reflecting city policies by following the international sustainable development discourse.

6. Conclusion

In this paper we argued that SIs need to be well integrated in the local policy process and should be adapted to different contextual circumstances. In doing so, however, we also warned against creating a strong bias to only one or two dimensions of sustainable development. Our proposal was using a set of common or generic Sis and adjusting these to the local specific circumstances. It would then allow for a two way process of mutual adjustment between common or generic SIs and local circumstances. Ideally, SIs would inspire policy innovation and help to avoid the skewing of definitions of sustainability to whatever ‘fits’ in a local context. In this paper we reported on the first explorative phase of our research. It meant to assess whether cities use SIs in accordance with our idea of a ‘two way process’.

Our first conclusion is that, in the cities studied, SIs are rather well integrated into the local policy process. They indeed help to inspire adjustments to existing policies and the development of new policies. In the meantime, SIs are also improved based upon newly emerging policy themes, changing local conditions and learning regarding how best to measure aspects considered relevant. Secondly, by well integrating them into local policy processes, SIs are indeed used to translate the ‘fuzzy’ and abstract notion of sustainable development into locally relevant policies.

Thirdly, however, evidence is less convincing is indicating that common sets of SIs can help to avoid a biased focus on sustainable development that simply ‘fits’ the local context. Our findings do show that policies are gradually adjusted so as to better reflect a balanced pursuit of economic, social and environmental objectives. Also, our findings suggest that SIs help to do so. Cities such as Singapore and Hong Kong have used common sets of SIs to inspire their own sets of indicators. Our findings are, however, not suggesting that such common sets of SIs function as a benchmark to continuously inspire policy development in accordance with the desired balanced pursuit. A real ‘two way process’ of combining common sustainable development principles and SIs with local developments of SIs to inspire new policy development was not found explicitly. Importantly, reflection of a city’s SIs to common sets of SIs might also occur in a more informal way. This can for example be done while developing or renewing existing sets of SIs, or by embedding this process of (re)development in the wider global sustainable development discourse. It is a question that would require further research, which explicitly addresses the process of developing and renewing SIs. It is indeed the focus of a second, and more elaborate, study into the role of SIs in urban governance we aim to conduct.

Concluding then, our findings suggest that SIs help to translate the 'fuzzy' and abstract notion of sustainable development into locally relevant policies. How such a process of translation might be improved by also reflecting back to common sets of sustainable development principles and of SIs is, however, a question we aim to pursue in more detail in the next phases of our research.

7. References

Baker, S., M. Kousis, D. Richardson, S. Young (1997) *The politics of sustainable development: theory, policy and practice within the European Union,* Routledge, London.

Beder, S., 2006 *Environmental Principles and Policies: An Interdisciplinary Approach*, London: Earthscan.

Briassoulis, H., 1999. Who Plans Whose Sustainability? Alternative Roles for Planners, *Journal of Environmental Planning and Management* 42:6, 889-902.
Bruntland, G. (ed.), 1987 *Our common future: The World Commission on Environment and Development*, Oxford: Oxford University Press.

Campbell, S., 1996. Green Cities, Growing cities, Just cities? Urban Planning and the Contradictions of Sustainable Development, *Journal of the American Planning Association,* 62:3, 296-312.
CEC, Commission of the European Communities, 2004 *Towards a Thematic Strategy on the Urban Environment*, Luxembourg: Office for Official Publications of the European Communities.

Connelly, S. (2004) *What is sustainable development? Mapping a contested concept,* Paper presented at the Association of the European Schools of Planning conference, July 1-4, Grenoble, Department of Town & regional Planning, University of Sheffield, Sheffield.

Connelly, S., 2007. Mapping Sustainable Development as a Contested Concept, *Local Environment,* 12: 3,259-278. Available through:
Creedy & Zuidema, 2012 (forthcomming) *Sustainable urban management; Improving local policies a sustainable future,* Farnham: Ashgate.

de Roo, G. and Miller, D., 2000. "Introduction - Compact Cities and Sustainable Development," in *Compact Cities and Sustainable Urban Development. A Critical Assessment of Policies and plans from an international perspective,* de Roo G. & Miller, D. (eds), Ashgate, Aldershot, pp 1-13.

Dhakal, S. and Imura, H., 2003, Policy-based Indicator Systems: Emerging debates and lessons, *Local Environment,* 8:1, 113-119.]
EEB European Environmental Bureau, 2006 *Commission adopts hands-off approach on urban environment, European Environmental Bureau,*
Available: http://www.eeb.org.

Global Footprint Network, 2010 *Ecological Footprint Atlas 2010,* The Ecological Footprint, Oakland, CA.; Global Office.

Greater London Authority, 2011. *The London Plan Spatial Development Strategy for Greater London*. [online] London: Mayor of London/ Greater London Authority. Available at: http://www.london.gov.uk/priorities/planning/londonplan [February 2012].
Healey, P., 2007 *Re-thinking Key Dimensions of Strategic Spatial Planning: Sustainability and Complexity*, in: G. de Roo and G. Porter (eds.) Fuzzy Planning: The role of actors in a Fuzzy Governance Environment, Aldershot: Ashgate.

Hezri A.A., 2004. Sustainability indicator system and policy processes in Malaysia: a framework for utilization and learning. *Journal of Environmental Management,* 73, 357-371.
Hong Kong Council for Sustainable Development, 2005. *Briefing on the sustainability assessment system.* Hong Kong Council for Sustainable Development.

Hong Kong Planning Department, 2001. *Sustainable development for the 21st century*. Hong Kong Planning Department.

Hong Kong Special Administrative Region Government, 2007. *The Hong Kong 2030 planning vision and strategy Final Report*. [online] Hong Kong: Hong Kong government/Development Bureau and the Planning Department. Available at: http://www.pland.gov.hk/pland_en/p_study/comp_s/hk2030/eng/finalreport/. [February 2012].
Jordan, A., 2008 The Governance of Sustainable Development: Taking Stock and Looking Forwards. *Environment and Planning,* 26 (1): 17-33.

Kemp, R., Parto S. and Gibson R.B., 2005. Governance for sustainable development: moving from theory to practice, *Int. J. Sustainable Development*, Vol. 8, Nos. 1/2, pp.12–30.
Meadows, D.H., D.L. Meadows, J. Panders, W.W. Behrens, 1972 *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind,* New York; Universal Books.

Ministry of the Environment and Water Resources, 2006. *Singapore green plan*

2012. Ministry of the Environment and Water Resources.

Mitlin, D. and Satterthwaite, D., 1996 *Sustainable development and cities*, in: C. Pugh (Ed.) Sustainability, the Environment and Urbanization, pp. 23-61. London: Earthscan.

Newton P., 2001. *Urban indicators and the management of cities*. [pdf] Manila: Asian Development Bank. Available through: Asian Development Bank [Accessed April, 2012]
O'Riordan, T., H. Voisey, 1998 *The Transition to Sustainability; The Politics of Agenda 21 in Europe*, London: Earthscan.

Richardson, D. 1997 The politics of sustainable development, in: Baker, S., M. Kousis, D. Richardson, S. Young *The politics of sustainable development: theory, policy and practice within the European Union,* Routledge, London.

Rogers, M. and Ryan, R., 2001. The Triple Bottom Line for Sustainable Community Development, *Local Environment: The International Journal of Justice and Sustainability*, 6:3, 279-289.
Rydin, Y. 1997 Policy networks, local discourses and the implementation of sustainable development, in: Baker, S., M. Kousis, D. Richardson, S. Young *The politics of sustainable development: theory, policy and practice within the E uropean Union,* Routledge, London.

Rydin, Y., Holman, N. and Wolff, E., 2003, Local Sustainability Indicators, *Local Environment,* 8:6, 581-589.
Seabrooke, W. et al., 2004, Implementing sustainable urban development at the operational level (with special reference to Hong Kong and Guangzhou), *Habitat International*, 28, 443–466.

Selman, P. H., 1996 *Local sustainability: managing and planning ecologically sound places*, New York: St. Martin's Press.

Shen, L.Y. et al., 2011. The application of urban sustainability indicators: A comparison between various practices, *Habitat International*, 35, 17-29.
Singapore Government, 2009. A Lively and Liveable Singapore: Strategy for Sustainable Growth. [online] Singapore: Ministry of the Environment and Water Resources and Ministry of National Development. Available at: http://app.mewr.gov.sg/web/Contents/ContentsSSS.aspx?ContId=1034 [February 2012].

The City of Johannesburg, 2011. *The Johannesburg's Growth and Development Strategy 2040*. [online] Johannesburg: Executive Mayor/ The city of Johannesburg. Available at: http://www.joburg.org.za/gds2040/gds2040_strategy.php [February 2012].
The Pastille Consortium, 2002. *Indicators into Action: A practitioners guide for improving their use at the local level*. London: European Union

The Pastille Consortium, 2002. *Indicators into Action: Local sustainability indicator sets in their context.* London: European Union
United Nation, 2007. *Indicators of sustainable development: Guidelines and methodologies.* New York.

Valentin, A. and Spangenberg, J.H., 2000. A guide to community sustainability indicators, *Environmental Impact Assessment Review*, 20, 381–392.