

# A figure/ground analogy for integrating sustainability and planning

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## Abstract

This article proposes a figure ground analogy as alternative way of conceptually integrating sustainability and planning. Within this framework planners are challenged to creatively consider planning practice and thought against a background of sustainability impact; and actively implement sustainability interventions in day-to-day planning activities. The article highlights three core issues as means of demonstrating this integration. Environmental footprint analysis aligns living standards and associated resource use with the urban environments expressed through planning. In addition, infrastructure serves as physical expression of the [un]sustainability of our cities; and the potential that a change in paradigm, thinking and action can bring about. Community participation is positioned within this potential for change as a way for poor communities to address the imbalance in resource use and distribution in, especially, cities. The article concludes by framing the figure/ground analogy within the complex reality of planning problems within which planners' have the inherent abilities and potential to plan for sustainability in our cities and settlements.

## 'N FIGUUR/GROND METAFOR OM VOLHOUBAARHEID EN BEPLANNING TE INTEGREER

Die figuur/grond metafoer stel 'n konseptuele integrering van volhoubaarheid en beplanning voor. Hierdie artikel daag beplanners uit om binne hierdie raamwerk beplanning kreatief te heroorweeg teen 'n agtergrond van beplanningsinvloed op volhoubaarheid; en om volhoubaarheid prakties te implementeer in alledaagse beplanningsaktiwiteite. Die outeur maak gebruik van drie voorbeelde om die integrasie te verduidelik. Voetspoor analise ("environmental footprint analysis") druk die verband tussen lewensstandaard (en geassosieerde hulpbronverbruik) en die leefomgewings wat deur beplanning geskep word uit. Die infrastruktuur-bespreking dui op die fisiese manifestasie van die [on]volhoubaarheid van ons stede, geskakel deur die voetspoor analise, asook die volhoubaarheidspotensiaal inherent tot infrastruktuur gesien deur die lens van volhoubaarheid. Werklike inspraak in beplannings-aktiwiteite en prosesse word gesien as 'n kritieke manier waarop gemeenskappe die wanbalans in hulpbron verdeling kan aanspreek en regstel. Die artikel sluit af deur die figuur/grond metafoer te raam in die kompleksiteit waarin beplanners hulle begeef. Te midde van komplekse beplannings- en omgewingsprobleme beskik beplanners oor die potensiaal en kreatiwiteit om stede en nedersettings volhoubaar te beplan.

## SEBOPEHO/ MOTHEO WA TSHWANTSHISO HO AMANYA TSHETSOPELE LE MORALO KA TSELA E IKGETHILENG

Pampitshana e na e hlahisa sebopeloh/motheo tshwanthiso e le mokgwa o mong wa ho amanya ntshetsopelole moralo ka tselae ikgethileng. Moralong o na, baradi ba phepetseha hore ka boitsebelo ba shebise moralo, tshebetso, le mehopolokgahlanong le nalane ya tshusumetso ya ntshetsopelole, le ho kenya tshebetso, ka mafolofolo, moralo wa diketsahalo tsa mananeo a ntshetsopelole letsatsi ka leng. Tlhakisiso ya Environmental footprint, e amahanya maemo a ho phela a amanang ka kotloloho le dilhahiswa, le tikeloho ya metse-seteropo, e toboketswang ke moralo. Hape disebediswa tsa setjhaba di hlahella jwalo ka ponahatso ya hore metse-seteropo ya rona e tswela pele kapa tjhe, le bokgoni bo diphephetso (paradigm), mokgwa wa ho nahana le mehato e nepahetseng di ka e tlisang. Karole e bapalwang ke setjhaba e bapisitswe le bokgoni bona hore ho tle ho be le diphephetso ho ba kojwana di mahetleng ka ho tliisa tekatekanyo ho abeng maruo, haholoholo, metse-seteropong. Pampitshana e na e phethela ka ho hlahisa sebopeloh/motheo wa tshwanthiso ka hore diphephetsong tsa ho rala tseo ka tsona baradi ba nang le bokgoni bo phethahetseng le tsebo ya ho rala ntshetsopelole metse-seteropong ya rona le dibakeng tsa ho dula.

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## 1. INTRODUCTION

Letters on this page are organised into black shapes on a white background enabling us to organise them into words, sentences and paragraphs ...

Our visual field normally consists of elements that we organise into two opposing groups in order to comprehend the structure of the visual field (in other words, to make sense out of what we see); positive elements that we perceive as figures, and negative elements that we perceive as background for the figures. Our perception and understanding of what we see depends on how we interpret the interaction between the positive and negative elements (Ching, 1979: 109). The classic "two faces or a vase" picture (Figure 1) illustrates this point.

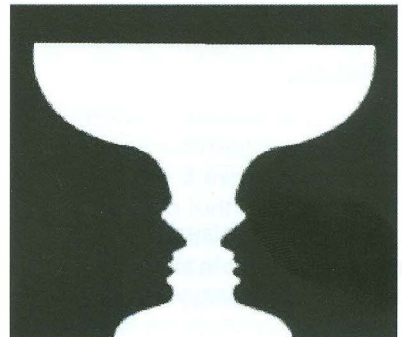


Figure 1: Two faces or a vase. (Source: Ching, 1979: 109)

Looking at this picture one's perception continuously shifts between what you perceive as the form giving elements, i.e. the white vase (the figure) on a black background or black faces on a white background. Be it as it may, the figures cannot exist without the contrasting background, or in the words of Ching "they form an 'inseparable reality'" (Ching, 1979: 110).

Ching's 'figure/ground' is used as metaphor for integrating sustainability

and planning. This analogy brings sustainability into the planning picture in a way that confirms the "inseparable reality" of planning thought and practice (intervention) and the ecological support base underpinning life of all living systems (including cities as expression of planning). This figure/ground approach is a non-traditional reflection on planning based on a recognition that major planning (and consequently infrastructure) interventions shaping South Africa's cities and settlements do not consider their immediate and/or long-term ecological implications (Lichtman, 2003; SACN, 2006). Harrison (2006a: 6) frames this inconsideration as a 'disconnect' between "the discourses of integration, sustainability"; and the practices of planning and environmental management. In a time of reflecting on planning in the country *per se* (Harrison, 1996), this metaphor also motivates for creative (Merrifield, 2006) and innovative planning practices and methodologies to bridge this chasm between planning and its ecological interconnectedness.

### 1.1 Introducing the paper; creativity and the planning debate

Creativity and innovation, critical in managing change in the planning environment (Higgins & Morgan, 2000), are abilities that planners in South Africa should appreciate, nurture and integrate in numerous strategic and spatial planning processes. Creativity in this regard is referred to as "the ability to repackage or combine knowledge in a new way which is of some practical use or adds value." (Higgins & Morgan, 2000: 118) In a time when the planning profession is caught between modern and postmodern planning paradigms (Allmendinger, 1998; Gleeson, 2000; Harrison, 1996), creativity and innovation must give much needed direction to address pertinent 'normative' and 'practical' quality of life and ecological issues in South Africa's human settlements.

References to 'post' in South Africa's planning discourse, most notably 'post'-apartheid planning and 'post'-modernist planning, highlight that the planning profession — in theory and practice — is permeated with

change and efforts to integrate practical and theoretical shifts related to change. Harrison (1996: 29-30) refers to some of these changes as a "diffusion of power"; "spatial segregation"; calls for a "flexible urban form" and a loss of faith in "master ideologies and narratives" (on this point also see Allmendinger, 1998). Authors in the field of sustainability (D'Cruz & Satterthwaite, 2004; Satterthwaite, 1999; Swilling, 2004) mirror these changes and characterise the 'post' planning paradigm by a 'lack of understanding and integration of ecological sustainability and resource base implications of planning', as well as the recognition of the voice of communities and the poor in the urban planning debate. In addition Harper & Stanley (1996: 414) note that "postmodernists, communitarians, feminists and deep ecologists have made valuable and valid critiques of planning". They pointed out that institutional planning frequently conceals the "disempowerment of certain communities".

In addition, planners find themselves in a time of great global and local change (Nederveen-Pieterse, 2004; Harrison, 2006), where critiques force recognition of ecology and sustainability (and other matters) in planning. Planners in this context should creatively revisit basic normative and technical planning fundamentals to integrate planning and sustainability aims. In this regard the Town Planning Network in the United Kingdom carried out a survey to establish the importance of 'creativity in planning practice' (Higgins & Morgan: 2000, 121); "people in both the private and public sectors cited the importance of creative thinking in dealing positively with profound change in the way planning as a service is being carried out." Planning as a service is underpinned by normative frameworks, which have direct ethical implications for change, interventions and decisions made in a complex environment (Cilliers, 2000). Gleeson (2000: 132) frames this argument as "enlightened modernity", a way out for planning; "if modernisers want planning to survive they must forward a vision for its political-'ethical renewal' that transcends the verities of simple industrialism ... , what is needed is a re-enlightenment of

planning that would banish the lengthening shadows of neo-liberalism 'and ecological degradation' [emphasis added]."

The figure/ground approach, as applied in this paper, thus proposes a creative way of appreciating planning and its sustainability implications based on the above-mentioned arguments and critiques.

Although planning thus — theoretically and academically — appreciates these critiques; innovation and sustainability activists and practitioners (and planners alike!) encounter countless frustrations dealing with inherent inertia and inabilities in planning *per se* to translate creative solutions into practical outcomes (so called 'quality of life' urban environments / settlements). How do planners connect the complexities of theoretical shifts, spatial implications and related quality of life and ecological influence?

The Town Planning Network (1999: 5-6 in Higgins & Morgan, 2000: 119) notes that "creativity can make the difference between a successful resolution on the ground and a negative outcome. This might be particularly true for planning as a profession, where there are few absolute rights and wrongs. The qualities that can be used to define creativity — the combination of knowledge in a new way, uncommon responses, redefining problems and solutions, a tolerance for ambiguity — can be used to describe the planning process."

Within this theoretical ambit, this paper argues for an appreciation of the figure/ground-approach as creative response to integrating planning and sustainability in line with the question posed above. This paper applies the figure/ground approach in aligning critiques on planning, in particular the plight and voice[s] of poor communities, as well as the call for creativity in planning, with the ecological resource base underpinning planning activities. The 'environmental footprint' point of departure serves as a practical expression of this integration — as a way to level the playing field a little (so to speak). The physical infrastructure discussion represents the tangible intervention potential related to the figure/ground approach; in



other words the ability of planners and planning to change the future through physical and spatial interventions.

The research is based on an integration of 'innovation planning, complexity in planning and sustainable cities' literature and theory and thus framed at city scale. Nono and Patience's stories emerged from field research conducted in partial completion of an M(Phil) in Sustainable Development Planning and Management.<sup>1</sup> The topics for discussion have been delineated with full recognition of the multitude of interactions that could be explored through such a figure/ground approach, however, based on the literature review the following topics are highlighted in this discussion:

- The environmental footprint, an integrated expression of people's living standards, reality of their urban environment, and resource use. It is regarded as one 'measure' of sustainability. In this regard, planning is seen as the interventionist approach to guide and redistribute resources.
- City infrastructure and the imperative to make sustainability interventions at this level. In this regard the figure/ground relationship is expressed as the impact of planning and related infrastructure on urban environments for the poor, the natural environment and notions of urban integration. In this process 'participative planning' and governance serves as a vehicle for the poor to collectively improve their situation and develop a platform to interact with formal city planning processes (and vice versa, of course).

## 2. BACKGROUND

The majority of current, modern and high-density cities need the

ecological life-support of distant regions (Lichtman, 2003) and global trade (Nederveen-Pieterse, 2004) in order to survive and meet peoples' basic and quality of life needs. This unsustainable outlook is entrenched in, amongst others, planning and growth patterns of inefficient and non-renewable energy use, unsustainable transport and construction practices, as well as loss of biodiversity (food security) in cities.

Merrifield (2006)<sup>2</sup> cautions that the global planning-ecological interface is characterised as a massive climate change 'meltdown' with unprecedented and unpredictable ecological and climate crises, reduction in runoff water (up to 10%), shrinkage of South Africa's terrestrial biomes by up to 40%; and significant losses of biodiversity. South African cities in this regard generate close to 80% of all carbon dioxide emissions and account for three-quarters of industrial wood use. Some 60% of all water withdrawn for human use ends up in cities in the form of irrigation of crops (food supply to cities), drinking and/or sanitation (SACN, 2004: 111). The economic and environmental reach of the city thus influence beyond its geographic and planning city boundaries.

The first figure/ground issue for planning and sustainability emerges. What do planners do to tangibly and spatially link global and local realities of ecological resource flows? In addition, how do planners link the quality and influence of urban environments with these flows? These questions are answered by sketching the stories of Nono and Patience within the understanding of an "environmental footprint".

## 3. THE ENVIRONMENTAL FOOTPRINT

An environmental footprint is an approach whereby the total quantity of materials consumed is reduced to an equivalent land area (Swilling,

2004: 13). Environmental or ecological footprint analysis in this regard constitutes total resource consumption and waste generation by a person, city and/or nation (SACN, 2004: 124). An environmental or ecological footprint<sup>3</sup> is thus indicative of an entity's impact on the environment through their consumption of natural resources represented as the amount of land needed to produce the resources consumed. Gasson (2002) expresses an environmental footprint in a city-ecology relationship; "the sustainability dilemma is that earth is a closed system as regards stock of natural capital, with a fixed extent of biologically productive land", yet the demands of growing population overshoot the capacities of earth's sources and sinks.

The World Wildlife Fund (WWF) (in SACN, 2004: 124) set the global "fair Earthshare" footprint at 1.9 ha/person in 2002 to indicate at which point resource consumption and waste generation overshoot the planet's ecological carrying capacity. Compare this figure to South Africa's general *per capita* footprint of 4.02 ha/person; Hong Kong of 7.1; Kuwait of 10.3; and Singapore of 12.4 (SACN, 2004: 125) and it becomes clear that consumption and waste patterns in our cities are overshooting the ecological carrying capacity of the planet numerous times.

### 3.1 Poor [un]sustainable cities; South Africa's Living Standard Measure (LSM) 1-4

Patience and Nono<sup>4</sup> are two women who, with their respective extended families, make a living in Gugulethu (or 'Gugs') in the notorious 'Cape Flats' area of the Western Cape.<sup>5</sup> According to the Living Standard

Measures (LSM)<sup>6</sup> index the area where they live corresponds to LSM levels 1-4 that denote, amongst others, an average household

<sup>1</sup> Through the Sustainability Institute (University of Stellenbosch, School of Public Management and Planning)

<sup>2</sup> Presentation made at University of Pretoria - SAPI Planning Spring School 2006 entitled "Is there a Future for Planning?"

<sup>3</sup> Henceforth referred to as environmental footprint in this paper.

<sup>4</sup> Fictitious names, real names of household respondents changed in order to protect privacy.

<sup>5</sup> Household level interviews conducted in Gugulethu in order to establish the family profiles and related Living Standard Measures for the family (LSM).

<sup>6</sup> The LSM index is a research tool developed by the South African Advertising Research Foundation (SAARF) that measures the population's wealth and standard of living, with the poorest of the poor in LSM 1 increasing to LSM 10 <<http://www.gcis.gov.za/docs/portcom/saarf7.pdf>> [accessed on 10 May 2006].

income of between R862 and R 177 4.<sup>7</sup> Patience and Nono's family profiles, summarised below, are representative of the standard of living, purchase power and exposure to information associated with LSM 1-4 in 'Gugs', Cape Town.

Patience's situation (LSM 2/3):

- House and occupancy: 9 people in a 60m<sup>2</sup> house in disrepair (no insulation and/or energy efficiency interventions);
- Service delivery: Waste removal, water connection to house, outside toilet (water-borne) and bathroom; service delivery is erratic and waste heaps in the streets cause health and other hazards; untarred roads, together with unsafe and unhealthy indoor space heating and cooking practices (burning fossil fuels) increase the ambient air pollution;
- Entertainment: TV (mainly channels 1, 3 and "e"), radio and second hand magazines — *You and People*;
- Finances: R780 (HIV grant) for entire family, spent as follows: R300 groceries; R 100 electricity (R50 for 2 weeks); R50 rent; water is not paid for due to unaffordability (outstanding bill of about R3000); R50 towards the savings club;
- Aspirations: Patience would like to add a ceiling to her house and 'fix-up' the house in terms of appearance; she is concerned about her children's safety in the community and their education (future prospects); she would like to buy/win a container in order to open a 'spaza' shop where she could sell sweets, magazines and other day-to-day consumables;
- Savings club: There are about 30 people in the savings club and she gets her share in December (R3000). Last year this saving enabled her to take the family to the beach (R250 = transport) at Christmas and allowed for additional groceries.

Nono's situation (LSM 3/4):

- House and occupancy: 10 people living intermittently in a 70m<sup>2</sup> house — fair quality house with ceiling (no insulation);
- Finances: Income is some R 1 700, spent as follows: R500-R600 food; R50 water; R 100 — 150 electricity; buy clothes only during festive season, balance on school fees and 'incidentals';
- Fully serviced area in Gugulethu; tarred roads; waste accumulation in streets and disrepair of infrastructure (potholes, broken mains, leaking taps etc.);
- Entertainment: TV (watch all SABC channels and 'e' channel), radio, regularly buys range of popular magazines;
- Aspirations: Nono is looking for another job as she experiences racism at her current job; she would like to improve her education through computer courses — she is an aspiring computer programmer. Her biggest concern for the area is 'the youth'; she feels they are "corrupt". Impression based on the high drop out rate of school children, boys in particular, which leads to crime in the area. She also sees 'the shacks' as a real threat as they "harbour social problems that spread to the whole of 'Gugs'.

### 3.1.1 Walk in their shoes; the footprint of living standards

Based on the information presented in the family profiles the environmental footprints for the two households were respectively calculated as 1.3

ha/person and 1.8 ha/person.<sup>8</sup> The average Capetonian's footprint, in comparison, is 4.28 ha/person (SACN, 2004: 125) associated with increased levels of resource consumption, comprehensive municipal services and generally "better" urban environments. A number of figure/ground implications arise.

The approach questions the imbalance in the use and distribution of natural resources linked to the standard of living in urban

environments. This 'imbalance', a central theme in the 'sustainable cities' debate, has direct bearing on planning and related notions of poverty (Lichtman, 2003; Malik, 2001; Swilling, 2004). 'Over-consumption by the middle class' (and rich) exploits natural resources and leads to 'imbalances in the distribution' of natural resources to the poor. Swilling (2004: 3) questions whether "it is possible to resolve urban poverty without reducing over consumption by the middle class and rich of key natural resources" when dealing with sustainability in cities. Malik (2001: 878) describes these imbalances as they pertain to the contemporary, non-western city as "unequal development and distribution of resources, areas of extreme affluence and poverty, inadequate public transport services, pollution and unremitting squalor."

Given the realities and constraints of inequality and poverty, planning through a sustainability lens, should aim to make it possible for people everywhere to acquire the basics of food, water etc. in ways that are "efficient, equitable and ecological" (Lichtman, 2003: 4); levelling the playing field (yet again). Lichtman fixes the sustainability lens on the 'poor' that bears the brunt of the damage caused by unsustainability in cities. The damage of unsustainable resource use and current patterns of economic development in poor urban areas (for example urban air pollution and deforestation) can be addressed, but it does not necessarily increase people's standard of living, "many people live in [such a] condition of 'sustainable poverty'" (Lichtman, 2003: 4).

Based on the quantitative expression of a footprint, Patience and Nono's consumption and waste patterns (environmental footprints) seem 'sustainable' compared to the global 'fair Earthshare' footprint. Also, in a global context, their consumption patterns are 'in line with' Lichtman's (2003: 5) statement that "earth's resources and pollution sinks simply cannot accommodate 8-10 billion people living at current OECD patterns of consumption"; in other words footprints overshooting the 'fair

<sup>7</sup> "Overview of LSM and possible area correlations" — information contained in informal class handout supporting household level interviews.

<sup>8</sup> Calculations based on the family's respective profiles, calculator used on <www.earthday.com> - accessed on 25 May 2005.



Earthshare'. However, within a normative planning assessment a different picture emerges; Patience and Nono's sustainable footprints relate to 'poor quality of life' (expressed in their stories), 'poor urban environments and notions of sustainable poverty.'

This disconnect between what planning should achieve and the 'real' urban environments — in other words Nono and Patience's stories juxtaposed by ecological impact as figure element against the planning background — aligns with how sustainable cities are 'defined' in general.

### 3.2 Sustainable cities

A number of authors exploring the topic of 'sustainable cities' invariably argue their perspectives based on a definition of sustainability that includes 'constrained resources' thinking (Lichtman, 2003; Satterthwaite, 1999; Swilling, 2004). Their perspectives reference the environmental footprint of cities and/or their inhabitants; in other words the interaction of people (and related social systems) and the natural resources and resource flows that support these systems in cities. Swilling (2004: 12) captures 'sustainability' in this regard as the "long-term viability of both the natural systems within which social systems are embedded, and the social systems themselves that are so dependent on the services provided by natural systems." Pieterse (2003) and D'Cruz & Satterthwaite (2004) confirms that resource flows in cities — and the use of these resources — have direct implications for [in]equality, poverty, environmental impact and change needed for growth and development in cities; thus direct implications for the range of planning activities. See how the playing field changes when our perception of certain figure elements (like equity) change?

Sustainability as figure element against the 'interventionist potential' of planning to change the quality of life and ecological outlook of cities are shaped by two distinct perspectives in the debate, namely northern- and southern-hemisphere thinking and practice.<sup>9</sup> The Stockholm

Environmental Institute (SEI) defines sustainable cities as cities that have action plans and policies in place for; adequate resource utilisation and availability; social comfort; equity; economic development; and prosperity (also for future generations).

SEI highlights the process and pattern aspects of sustainable development that are important to cities for the effective governance of lifestyle changes (towards sustainability) and consultation and consensus building. They also recognise that cities are not self-contained entities and require inputs and outputs (flows of goods and services, people, communication, goods and resource flows), many of which are uncontrollable.

Development Alternatives in India (DAI), on the other hand, highlights that sustainable cities, interconnected with the environment and economy, in turn leads to minimum acceptable quality of life and that these cities typically are faced with issues of air pollution, congestion versus availability of open spaces and poverty. DAI defines a 'sustainable city' as one that is able to provide the 'basic needs of the population' along with infrastructure that take care of the population's needs, and that these 'needs should be met without discrimination.'

Quite a difference in sustainability reference points exist in these two hemispheres of the world; and how planning and sustainability goals should be integrated to achieve the mutual goals of quality of life, equity, resource responsibility and good governance sought in sustainable cities. Higgins & Morgan (2000: 120) argues that creative planning forges links between different objectives and diverging/conflicting agenda's and stakeholders in the planning environment, a critical skill when dealing with sustainability in cities. Sustainability, interconnecting a number of the postmodern critiques, could thus be viewed as "a pattern of developmental ethics, priorities, choices and activities where humans and the environment are interconnected beneficiaries,

depending on certain 'realities' (for example depleted natural resources and human ability to create and develop new technologies), as well as the context (culture, development stages/priorities etc.)" (Beyers, 2005: 2)

Malik (2001: 874) supports this north/south perspective as "cities and worlds divided into those who are always developed and modern and those who must continue to develop and modernize without ever becoming so."

Theoretic thinking on resource use and planning's normative ideals do not always align with how these ideals manifest vis-à-vis actual urban environments. Allmendinger (1998: 229) points out that it might be alluring to think that we live in "New Times; a feeling that has been around the 5th century ...", and that post-modernism debates in planning could be nothing more than a red-herring that distracts from the 'continuities' like race, class, gender — and I would like to add ecology — that do not go away ... We might be theorising planning into inaction; 'with clear, quantitative drivers like "footprint analysis" that links quality of life and ecological planning implications, planning can and should make dedicated sustainability decisions.'

The environmental footprint — viewed as figure against the background of living standards, context and real stories of people living in cities — becomes the great equaliser of how resources are used and distributed. It questions how planning — as major interventionist activity in guiding resources at city level — will address these imbalances through physical, spatial and strategic planning interventions.

## 4. [UN]SUSTAINABLE INFRASTRUCTURE PERPETUATES [UN]SUSTAINABILITY

Cities are part of a broader ecological system of resource flows, consumed by the city, and this consumption, in the various urban contexts, manifest in 'physical (form giving) figure/ground patterns in cities that are either geared towards or away from sustainability'. Sustainability

<sup>9</sup> Both Stockholm Environmental Institute and Development Alternatives, India perspectives captured in document on site <<http://www.rec.org/REC/Programs/SustainableCities/>> [accessed 5 May 2006].

has direct spatial manifestations effect on the lifestyle and standard of living of people in cities as seen from the above-mentioned stories. Here the 'playing field' of equity and quality of life becomes a tangible expression of what we as planners do and decide.

Cities are given shape, meaning and influence by virtue or vice of their form; 'form' that is defined by space[s] and/or physical infrastructure. Figure 2 illustrates this principle in tangible city building terms — by highlighting the alternate figure and background elements of

#### 4.1 Physical infrastructure

Physical infrastructure pins down the sustainability of a city in physical form for a number of years; and exerts control over the potential to bring about sustainability change in cities. The South African Cities Network (SACN) follows a fairly strong 'built form' approach in highlighting sustainability in South African cities and confirms that 'the built environment [ or city]' influence on the envelope of natural resources that sustains any settlement and makes it 'liveable' (SACN, 2004: 14). Pieterse (2003: 9) contextualises

- the size of cities and its relation to efficiently moving goods and people; and
- the type of buildings and settlements on energy use, are a few examples.

Lichtman (2003: 5) highlights three general global influences related to infrastructure, namely pollution of natural systems (as a result of infrastructure); depletion of natural resources (maintaining infrastructure and energy intense forms of infrastructure); and loss of naturalness (through encroaching infrastructure).

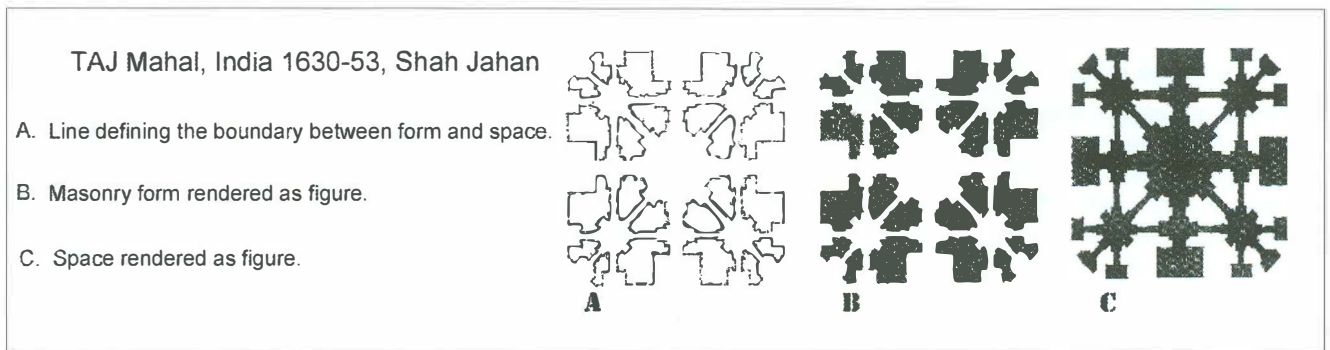


Figure 2: Figure/ground for the Taj Mahal  
Source: Ching, 1979: 110

the Taj Mahal in Agra, India. The prioritisation of walls and/or buildings versus soft spaces like streets and squares might change, but the whole system remains intact.

Furthering Ching's analogy, two main 'form giving patterns' are thus distinguished in cities:

- Physical infrastructure (for example buildings and roads) interpreted as figure element against the background of urban space, and/or
- Urban space perceived as figure against city infrastructure as background. Urban space in this case includes functional urban spaces, as well as inherent city processes including peoples' activities, politics and policies, planning processes, governance systems and related ethics.

In planning practice both patterns hold potential for intervention and change towards sustainability in cities. "Within the context of planning practice, creativity is important in terms of both process and product." (Higgins & Morgan, 2000: 119)

'liveable' cities in anthropocentric sustainable development World Bank parlance where 'liveable' refers to "reducing urban poverty and inequality, creating a healthful urban environment ..., establishing an inclusive system." This view on the environment and urban development, in line with other perspectives like the "political empowerment approach" (Pieterse, 2004: 9) — although differentiated in its political and economic agendas — confirms the interconnectedness of infrastructure with environmental impact and use, as well as with issues of inequality, poverty and communities' participation rights in the processes of providing infrastructure.

A range of 'infrastructure related impacts' are reported (SACN, 2004: 17), for example:

- water and air pollution (as result of inefficient and energy intense forms of buildings and roads) on the habitability of the spaces that people use (and public health related to it);

For the purposes of this paper the notion of segregation, as major planning influence on the sustainability of cities, is added to this list.

##### 4.1.1 Urban integration

The influence of urban form and planning on city sustainability become particularly clear in the face of segregation. South Africa's highly segregated cities are proof that the apartheid urban form is not resource efficient (SACN, 2004: 14). Segregation leads to urban sprawl impacting negatively on available productive land and natural resources relative to urban population. Urban sprawl in turn extends the environmental footprint and this related de-densification creates capacity problems for infrastructure. 'Extended cities' thus place an enormous burden on the use of natural resources to 'fuel' the sprawl (for example increased water and energy usage), and sprawl places an additional burden on arable land and other ecologically sensitive areas needed for city growth and development and, more importantly, food production. Davis



(2004: online) coins 'sprawl' as both suburban sprawl and slum sprawl, which equally extends cities and have spatial planning and sustainability implications.

Tasneem Essop (2006), the Minister for Environment, Planning and Economic Development of the Western Cape Province, states that urban sprawl traps and dislocates the poor, "[and] critically endangers our unique environmental systems, agricultural areas and biodiversity habitats." The environmental impact of the built environment and related planning processes is thus negative when non-efficient and resource intensive forms of planning and infrastructure prevail.

Nono and Patience's stories as figure elements against a segregation, unsustainable infrastructure and associated poverty background, highlights the imperative of planning to redirect natural and planning 'resources' in cities as a critical part of integration. Pieterse (2004) questions whether current [neo-liberal] approaches to urban development will result in eradicating urban poverty and imbalances, and Swilling (2004: 24) notes that "greater equity of access for the poor to basic services will not be possible in an urban system that wastes a lot of money [and ecology] on an unsustainable system. 'Increasing eco-efficiencies in the middle class' [main beneficiaries of over consumption of natural resources] will release more funds for service delivery in poor areas." By directly addressing the sustainability aspects of infrastructure;<sup>10</sup> critical resources are freed up to the benefit of all sectors in our cities; levelling the playing field.

#### 4.2 Sustainability interventions in planning: now you see them, now you don't?

Given the direct call for broader integration of natural resources in planning, Pieterse (2004: 16) elaborates that sustainable urban development proves too elastic to be free of previous policies and legacies and that "sustainable urban development and its anchoring notion — integration — are essentially political in nature and stem from the various theoretical and political

standpoints that underpin them." However, given Patience and Nono's situation, systemic and on-the-ground changes are required to align sustainability and planning speaks with the urban environments they set out to create. "Sustainable Development has a very practical and tangible base to it. 'Small activities and interventions at the outset determine the medium and long term trajectory that a project or initiative will be on;' often impossible to change at a later stage. Sustainable development is not always the grandiose ideals and visions, but the small, practical activities ... ." (Beyers, 2005: 20).

Actual intervention and change in infrastructure at city and regional level is one step towards alignment. As Chapin & Kaiser (in Bruton & Nicholson, 1987: 71) point out "there is no quantum jump into the future", broad policies and general planning proposals need to be translated into detailed local plans. A sustainable settlement often starts with ideas around environmentally sound housing and simple low- and no-cost energy efficient house designs; or a food garden; and/or basic sustainable energy interventions like solar water heating or water recycling. A number of metropolitan councils, with support of NGOs, CBOs, research institutions and others, have translated quality of life and sustainability goals into practical frameworks for their cities, for example the City of Cape Town's report "The Ecological Footprint of Cape Town: Unsustainable Resource Use and Planning Implications" (Gasson, 2002). The report captures the ecological footprint of Cape Town based on for example waste, water, energy and environmental quality inputs and throughputs (Gasson, 2002: 9) and motivates for 'integration of infrastructure and the natural environment (sustainable infrastructure) as key driver to achieve sustainability in planning practice.' "Make greater use of renewable and locally available resources, reduce excessive and affluence-driven patterns of resource consumption, and increase efficiencies ... All of these imply a different approach to planning, design, construction,

operation, and management of buildings, local areas, industrial plants and industrial areas, infrastructures and whole cities." (Gasson, 2002: 13)

#### 4.2.1 The regionality lens

Lichtman (2003: 21) makes a case for promoting sustainability at regional level in a regional planning context. Regions could benefit from using a common planning framework that addresses the problem [of "implementing" sustainability in different city contexts] and related planning interventions, both technically in understanding the flows of local biomass, water, capital, and human skills ... , and in the organisational sense of how to develop effective dialogue about these issues. In this regard he notes that the following sustainable development issues could be tackled at regional level (Lichtman, 2003: 27):

- Energy (particularly related to efficiency, biomass and renewable energy);
- Organic agriculture;
- Water supply and treatment through natural and bio-engineered systems;
- Solid waste management and recycling;
- Sustainable transport;
- "Clean" industrial systems;
- [Regional] systems ecology; and
- Legal and justice issues related to sustainability

Common issues across regions, particularly lessons learned with regards to the above-mentioned interventions, related policy implications, as well as facilitation and project management, technology and materials advances should be shared and exchanged across regions in order to promote the implementation and mainstreaming of city level sustainability (Lichtman, 2003: 43). Through the development of the National Spatial Development Framework (NSDP), planning is fomenting a regional focus, where regional planning is poised to encompass planning goals set at national, provincial and local level.

<sup>10</sup> Technical details of how to make infrastructure sustainable has been captured in work of a number of NGOs, CBOs, research institutions and private projects in South Africa; the information is available and demonstrated.

Pitching planning goals at this level, provides an opportunity to align regional sustainability interventions with planning interventions and foment intervention strategies at regional planning level. Sustainability as figure element against a background of regional planning thus provides an understanding of 'where to intervene in current planning processes to promote sustainability in cities.' The key understanding is that, 'sustainable technologies and interventions have different spatial demands' than current 'modern' technologies. This spatial implication should be understood and 'appreciated in the creative planning approach from regional through local level planning.'

### 4.3 Paradigm shift

Sustainability thinking thus requires a paradigm shift in planning at this regional-local continuum of infrastructure planning and provision in order to:

- firstly, assess where sustainability interventions should be made in current planning practice (given the range of planning frameworks that do not always allow innovation), and
- secondly, direct spatial planning according to the basics of comprehensive sustainable settlement planning and sustainable infrastructure provision.

For example, the Bridging to the Future (Grounds for Change) Conference held in Amsterdam in March 2006, explored 'integration in planning and sustainability.' The conference called for planning to follow the natural flows of renewable and sustainable energy as general approach (figure) for aligning planning practices (background). At the conference Noorman (2006: 5) questioned whether planners can devise spatial design strategies that meet the aim of transforming our present energy system into a more sustainable energy system. His question underpins assumptions for integrating planning and sustainability; can planners come up with spatial planning strategies that transform cities into a sustainable future?

Figure 3 (example in the Netherlands) highlights spatial demands associated with planning that will transform cities to meet long term sustainability goals associated with sustainable energy interventions, a key aspect of sustainability in cities. Planning thinking and approach can thus

planning field for sustainability interventions. At a comprehensive level, these ecological and systemic flows could then direct the planning and development of infrastructure and settlements. "In this context, planning takes on a new importance in managing modern cities; achieving

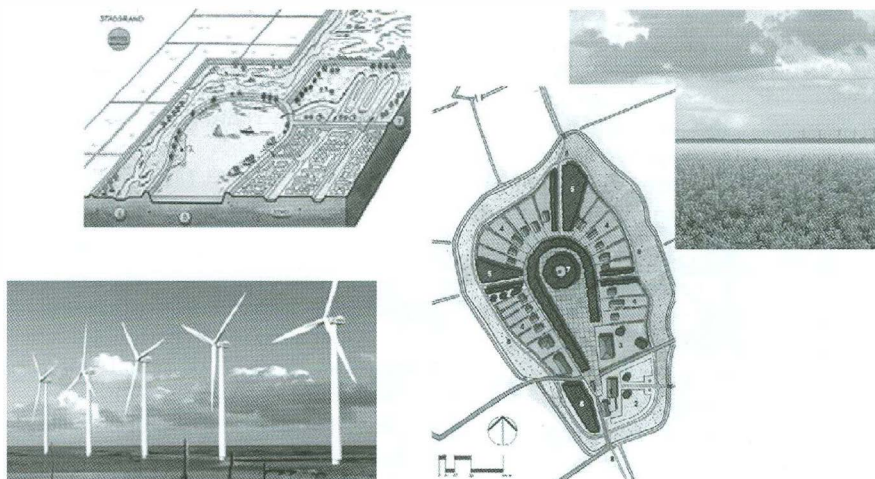


Figure 3: Spatial demands of planning for sustainability  
Source: Noorman, 2006: 9

change from planning simply based on what is possible in terms of current infrastructure and 'modern' technologies, to planning infrastructure (cities on the whole) based on natural flows (specifically energy flows, also see Gasson, 2002) that incorporate hybrid technologies, bio-technologies, renewable technologies, efficiencies etc. A change in perspective, by highlighting certain elements in the

sustainable development, regenerating derelict areas and reducing social exclusion." (Higgins & Morgan, 2000: 120) Levelling the playing field for all in cities through sustainability interventions and planning.

Figure 4 highlights this conceptual shift by showing how, for example, planning and sustainability should meet at various spatial levels (vertical integration). This overlay of spatial

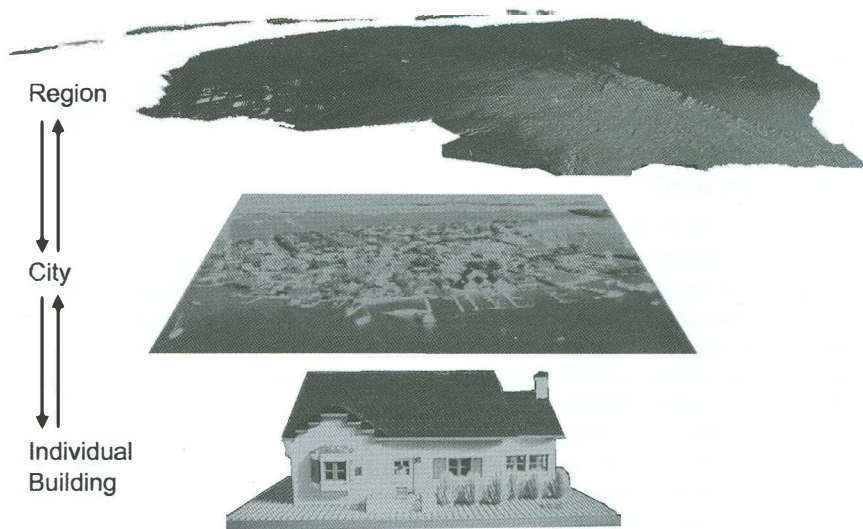


Figure 4: Spatial levels underpinning the figure/ground approach.  
Source: Noorman, 2006: 11



information underpins the nature of the figure/ground approach by confirming the interconnections of innovative sustainability technologies and planning interventions (physical infrastructure or technologies, and city processes or planning). 'Interventions and creative new innovations for sustainability are contextualised and made appropriate from regional sustainability level (within broader hinterlands and city footprints) through city to household level application, need and eventually individual footprints. This spatial connection drives the connection between the resource flows in cities and the environments created by resource use.' Integration of creative planning and sustainability infrastructure interventions can change the outlook for Nono and Patience's settlements or "unlock developmental potential and facilitating processes of spatial transformation that are cognizant of the 'lived-reality of our citizens'." Essop (2006)

#### 4.4 Urban aspirations

Infrastructure, in addition to a legacy of technological sustainability, 'also creates a legacy of embedded aspiration', especially in developing countries. Non-western cities have given up their inherent cultural and other identities in order to adhere to western aspirations (Malik, 2001; Oranje, 2003; Swilling *et al.*, 2002) of modern infrastructure, housing, roads *etc.* A number of non-western cities have rejected knowledge patterns of climate and materials, culture and indigenous economic behaviour in the pursuit of urban modernity. The result is that cities and planning functions were segregated into modernistic functional land use parts, mainly catering for transportation; 'and that embedded forms of knowledge of alternative, less resource intensive forms of infrastructure provision and planning were abandoned in the hope of attaining modern lifestyles.'

These modern cities focused on new forms and materials and technology with little relevance to history and culture (Malik, 2001: 875). In opposition to this city form — which was also perpetuated by western development aid — post-modern city movements oppose segregation and recognise that "urban and architectural expressions are not

universal but rooted in local history and culture." (Malik, 2001: 876). Postmodern planning critique permeates theory, infrastructure and calls for the unearthing of culture and identity, as well as older forms of knowing in cities and planning.

The contemporary non-western city thus demands a different approach (Malik, 2001; Pieterse, 2003; Swilling *et al.*, 2002), which according to Malik (2001: 877) means that cities need to balance their "needs with its resources, related to culture and identity and engage in debate to define its social, cultural and moral response" to people and social systems underpinning the city as a whole. African identities and culture would assist in the production of a planning system that would for the first time have (real) meaning and be of use to the majority of individuals and communities of post-apartheid South Africa." Oranje (2003: 176). Ching's analogy of an 'inseparable reality' in cities thus refers to peoples' needs, aspirations, culture and identity, together with the physical infrastructure, and related resource use that create this reality; i.e. the sustainable city. 'Infrastructure, as the most immediate "expression" of cities and their sustainability, is thus an integrated mix of 'aspiration' and how this aspiration combines with the realities of meeting people's needs within the limits of earth's natural resources ...'

#### 5. PARTICIPATION; CHANGE RESIDES IN PEOPLE

Participatory planning processes confirm the process aspects of the figure/ground approach. One of the fundamental changes that bring a shift in planning and sustainability is grass-roots level participatory processes (D'Cruz & Satterthwaite, 2004). Olivier (2004: 6) notes that participation in theory has three origins:

- Participation as good development project practice: Public participation in this regard is key to successful project implementation and it has become common practice to include participation in this form in large infrastructure projects.
- Participation as good governance (the relationship between the state and civil

society): This manner of participation is continuously being revived in new forms of democratic participation.

- Participation as political empowerment: This approach locates participation in a larger political struggle that links issues of under-development with political power (Olivier, 2004: 7).

One example of a model for engaging the poor in cities is the Slum Dwellers International Movement (SDIM). This movement aligns, to varying degrees, with the last two streams of participation outlined by Olivier (2004). In South Africa the Federation of the Urban and Rural Poor (FEDUP), with the support of the SDIM, has proactively mobilised sectors in poor communities to form key partnerships that support critical, community based housing and planning needs through mechanisms like the People's Housing Process (PHP). Planning and city processes that include grass-roots level communities and the poor in cities allow these community-specific solutions to emerge; and it provides a platform from which to engage with politicians and formal planning processes. Thus serving a dual purpose of empowerment up and down the hierarchy of the planning system these communities 'should' be part of.

This form of participation is supported by a number of perspectives *vis-à-vis* the potential or role that [especially non-western] cities play in reinforcing participation as key driver of sustainability, namely that:

- The 'urban resourcefulness' of cities has not been engaged (Swilling *et al.*, 2002: 5) through appropriate participation models.
- Cities should be seen as 'cultural' cities where culture is vital in sustaining a sense of place and identity (Malik, 2001: 880), and that appropriate participation should include these forms of knowledge.
- Cultural regeneration brings about "awareness that language, discourse and symbolic meanings are central to politics in cities in tandem with economic and "more formal" political processes" (Pieterse, 2003: 3), in which participation

provides links as critical form of discourse.

### 5.1 Participation for empowerment and negotiation

The model followed by the Slum Dwellers International Movement in India and Nigeria has proven that the poorest of the poor sectors of society (in cities; homeless) have an inherent ability to address their issues of extreme poverty and disempowerment by constituting their own organisations and poverty reduction programmes. The distinction made here is that these groups draw on their own resources and capacity, and engage and negotiate with governments (and others) for support (D'Cruz & Satterthwaite, 2004: 3). This negotiation platform with government fulfils a basic mandate of city planning and holds the potential to promote and incorporate sustainability interventions and principles in cities. Appropriate engagement on what communities need in terms of infrastructure, and making infrastructure sustainable and appropriate could change the dependence of these groups on government for progress. In addition, it addresses basic equity issues of poor communities in having a critical say in how city level resources are allocated and used. Essop (2006) contextualises this participation model in South Africa: "I am certainly not trying to romanticise the 'edge condition' of marginalised communities, I am merely challenging the planning profession to visualise the role they can play in enabling and validating people who have developed their own means to connecting into our cities through survivalist strategies."

Extrapolating this model to the broader society and planning realm, Pieterse (2003: 5) indicates that local action, as in the example of the SDIM, translates into ideas (in support of sustainability) that can create 'movements for change' and movements for creativity in planning as proposed earlier. In line with the community level knowledge sharing of the SDIM model, Pieterse (2003: 2) promotes ideas around 'epistemic communities' and 'organic intellectuals', 'where the latter are always on the move, seeking new

alternatives and ideas to link sustainability interventions to quality of life improvements for people.' With reference to the concluding statement made in 4.2.1, planning professionals should take responsibility for their creative development, plugging into networks of 'organic intellectuals' and free flowing information on sustainability practices in planning design and process. These processes are critical in promoting creativity in planning practice (Higgins & Morgan, 2000). Pieterse (2003: 6) further proposes that this 'organic' intellect should be focused on more than the 'modern epistemology', acknowledging multiple knowledge bases from a wide range of people [groups] in cities. In pursuing new knowledge about how cities work — as socio-ecological-'technological' systems that mimics nature — planners broaden the knowledge, technical assistance and innovation base applied to planning practice, theory and innovation.

#### 5.1.1 Governance

In order to make this grass-roots potential a reality in cities, supportive governance structures need to be in place (Pieterse, 2003; Malik, 2001). Pieterse, specifically, proposes the creation of a renewed public sphere "where alternative ideas for specific urban areas can find room to flourish" (Pieterse, 2003: 2). These interventions have strong connotations to equity (D'Cruz & Satterthwaite, 2004; Swilling, 2004) and Malik's (2001: 879) 'democratic city' ideas, and supports the transformation of segregated cities — but in actual fact — 'the transformation of unsustainable infrastructure.'

Culture/identity and planning practices that unearth these qualities in communities, and/or create urban spaces to frame and house these community expressions in the urban form emerge as figure elements against a background of transforming infrastructure. The switch in perspective between what is regarded as figure and background planning participation and governance priorities is brought on by the 'context' (Bruton & Nicholson, 1987; Pieterse, 2003).

Pieterse's ideas of 'homebru' solutions, linked to his notions of

'organic intellectuals', are particularly relevant to the contextual necessity of both planning and sustainability solutions for cities. 'Homebru' solutions seek 'contextually specific', organically produced 'policy and strategy ideas' that address the specific social, economic and cultural patterns of 'urban segregation, fragmentation and inequality' (Pieterse, 2003: 20). The SDIM approach, as well as Pieterse's ideas, bring the notion of sustainability and planning in cities within an understanding of 'contextual application'; a critical characteristic of dealing with the 'complexities' of planning scenarios.

## 6. FINDING COMMON GROUND AND CONFIRMING THE "INSEPARABLE REALITY"

Based on the argument of integrating sustainability and planning, planning thus emerges as common ground for tying together key spatial and process oriented dimensions associated with sustainability in cities. Planning remains one of the critical ways in which we guide infrastructure, resource use and forms (and legitimacy) of participation and governance.

### 6.1 Complex planning problems

Cities mirror the complexity of the earth's global environmental and biological processes at various scales (CSIR, 2004; Lichtman, 2003). Framed within the 'environmental footprint' discussion, cities as closed systems (Gasson, 2002) maintain links to the global network through ecological processes and urban institutional, trade and political processes etc. Non-linear interactions and constant change within the city, in terms of the environment it interacts with, indicate that cities could be viewed as complex adaptive systems (Wootton, 2006: online).

Planning (as profession) in the face of this complexity — and aiming to innovate in terms of sustainability — should fundamentally reconsider its basic predictive modelling capabilities and drivers. Planners, according to Bruton & Nicholson (1987: 52), can no longer merely produce, plan and manage development, they should "manage change in the environment" and respond to so-called "wicked



problems" or complex problems that link to other complex problems that link to other ...

In order to practically integrate resource flows and planning (through footprint analysis for example), planning should thus review its penchant to apply great linear certainty to interventions and outcomes, and approach planning and modelling from a reflective perspective in order to intervene, innovate and creatively manage change. Planning models or predictions should consider regionally based resource flows and the interconnectedness of these flows with city and household level applications (Gasson, 2002; Glenn & Theodore, 2006), planning and governance/ institutional decision-making (budgets). Regional sustainable development considerations for Africa — framed in the State of the Future (2006) Report — highlights this link: "Falling grain yields, water tables, and expanding desertification will continue unless local self-help is tied to government budgets, natural resource management planning ... " (Glenn & Theodore, 2006: 11).

In addition, planning often intervenes across the spectrum (patterns) of complexities in a city; from physical infrastructure planning to incorporate the cultural, historical and even spiritual dimensions of people in the process of doing so, through assessing relevant technologies and governance structures. In these complex processes, planning provides vertical (physical and process oriented planning) and horizontal (regional to household level resource flows and appropriate sustainability technologies) opportunities to innovate and bring about a change towards sustainability in cities. Tasneem Essop (2006) confirms that "the complexities to which planning must respond [to] and find creative solutions in African urban environments haven't necessarily changed. In terms of complexity, planning has to deal with the 'simultaneous, cross-cutting and context bound' issues of environmental stress, the urban-rural relationship, good governance and the eradication of both poverty and inequality."

Cites as complex adaptive systems are thus open systems, can adjust to change and develops over time (Nel & Serfontein, 2006: online) and requires a transdisciplinary approach in recognising new forms of knowledge and synthesising different science bases. "A complex adaptive system demands a new approach to urban planning, one that is principle driven ... , focusing on the future and the 'space of possibilities' [emphasis added] ... "

## 7. CONCLUSION

Planners, their creativity and abilities to recognise and plan for a sustainable future fill this space of possibilities.

The paper pointed out that the figure/ground integration of sustainability and planning suggests an approach that allows planners to:

- Creatively question the implications of the planning-sustainability interface within current literature and discourse; in particular footprint analysis (LSM and natural resources) and the interaction with corresponding (imbalanced) urban environments, as well as resource use and distribution in cities.
- Raise questions, in a time of global and local change (ecological influence and planning and professional [re]considerations), about these interactions and implications that require broader planning perspectives and interventions around participation, equity, infrastructure and governance.
- Prioritise innovative thinking, creativity, and action within an ambit of complex planning problems, in favour of 'sustainability interventions' (particularly infrastructure) that were not necessarily integrated before.

Planning sets a critical normative framework for the country that entrenches and guides quality of life and life style choices. A framework that in turn has distinct spatial implications; equally vis-à-vis the quality of urban environments created through various planning processes, and the quality of life related to the ecology that underpins

planning activities. Patience and Nono's stories are two small variants in this continuum, but representative of a mayor fault line. Over-consumption by the rich and middle class, cross-sectoral inefficiencies, as well as business-as-usual decision-making in planning and poor governance (amongst others) redirected their 'quality of life' urban environment — that planning set out to achieve initially — elsewhere in our cities ... The implication of their story is that "all" would have to live within the footprint profiles of Nono and Patience in order to live within earth's carrying capacity ... Certainly not a sustainable or equitable outlook for South Africa's cities. In his latest book, entitled *HEAT — How to Stop the Planet Burning*, George Monbiot (2006) unequivocally calls for lifestyles to change (reduced carbon emissions) in order to deal with the imminent climate change and sustainability disaster that faces humankind. Within this urgent call for radically sustainable lifestyles, we as planners must thus ensure that the planning frameworks and infrastructure we lay down enable people to switch to sustainable lifestyles and maintain sustainable lifestyles, if we are to succeed in integrating sustainability and planning. "The need to tackle climate change must not become an excuse for central planning." (Monbiot, 2006: xv)

Sustainability thinking in planning balances quality of life and resource use by breaking the pattern of assumption that we have unlimited natural resources to sustain our current modes of development (thus planning); and that certain sectors in cities could "hog" the majority of resources for elite lifestyles. By no means is sustainability a call for reduced lifestyle and/or quality of life; it challenges the resource base and way of life associated with that quality of life and the planning processes that create them.

The integration of sustainability into planning theory and practice thus requires a continuum of creative figure/ground prioritisation and conscious decision-making (as opposed to a bulldozer approach of blanket, generic sustainability interventions). In every planning scenario (whether straightforward or "wicked") planners are faced with

elements that make up their planning (visual) field. In every process and decision certain elements and decisions could be prioritised to make a tangible sustainability change/intervention towards city level sustainability (footprint); participation (equity) and/or sustainable infrastructure in order to balance resource use in cities; to balance the playing field for citizens and the environment, now and for the future. Every planner has the ability to change his or her perspective. A vase or two faces on a particular background? More importantly, do we plan cities based on maximum resource consumption serving only a few sectors in a city? Or do we plan sustainable settlements with energy- and resource-efficient buildings and technologies, sustainable energy solutions and conservation of scarce resources (water!)? In other words, settlements, where sustainable infrastructure and planning processes prioritise high quality of life needs for all against a background of balanced resource use?

Our choice.

"In order to meet the challenges of the 21<sup>st</sup> century, planners need to not only develop the capacity to creatively solve problems, but also develop a vision of what they want to achieve, and develop a mindset that is capable of reframing questions in new ways." (Higgins & Morgan, 2000: 126)

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