THE SOUTHERN AFRICAN HOUSING FOUNDATION

REGIONAL HOUSING CONFERENCE & EXHIBITION

9-11 JULY 2009

SWAKOPMUND, NAMIBIA

"SUSTAINABALE ALTERNATIVE TECHNOLOGIES"

Indicators and performance areas for sustainable human settlement.

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Introduction

The planet increasingly faces major challenges which place ultimate limits on unbridled economic growth: overload of the capacity of the biosphere to absorb and process industrial toxins and wastes; catastrophic climate changes resulting from anthropogenically caused global warming; oil (and therefore) energy depletion and the depletion of other natural resources; and the limits of the global debt/credit pyramid. The carrying capacity of the earth is also unable to cope with an ever increasing population, now estimated to be six billion people and projected to reach nine billion by the middle of the century.

If life on earth is to be sustained, the challenge is for people to live radically different life styles with regard to natural resource use and the financial, biosphere and climatic limitations referred to above. In recognition of this fact there are increasing calls internationally and locally for the development of sustainable human settlements, which will take into account the challenges referred to above. These settlements should ideally be compact, combining work and living spaces. They should offer a high degree of social equity, social integration and they should be developed with a sensitivity to the natural carrying capacity of the local environment.

The United Nations (Habitat Agenda: UNCHS, 1996) has developed a comprehensive set of indicators to measure and score the performance of settlements in terms of their sustainability. However, notwithstanding the importance of local action and initiative, there are arguably certain global and national policy and strategic preconditions necessary for settlements to achieve the intended sustainability outcomes. For example, without appropriate macro-economic policies that encourage stable employment outside the current economic growth paradigm, individual human settlements however sustainable in their own right, will achieve little. Settlement planning, particularly with regard to the poor, requires national, indeed global responses that include access to social and basic services, economic activities, safety and security and other settlement features which will be further detailed below. Without these, humanity will still be on a collision course between exponential economic growth and the finite limitations referred to above.

The aim of this paper is to contribute to the development of a consensus about indicators for sustainable settlements. The paper intends to achieve its aim by taking one set of global sustainability indicators, the Habitat Agenda indicators (arguably the most comprehensive set of indicators of sustainable human settlements) as a starting point. The paper intends to align impressions of South African policies and practices (including provincial and local government human settlement practices) to the Habitat indicators in order to: (a) identify some of the national policy and strategic preconditions that will enable actual human settlements to achieve a credible level of sustainability; and, (b) to score South African performance in terms of both policy and local action in relation to the Habitat indicators.

The paper commences with a summary of the combined three global challenges to enabling and sustaining a better life for all on the planet. It then explicates the Habitat Agenda indicators of sustainable development. Then the paper aligns the Habitat Agenda indicators with South African policies and practices in a tabulated format: the table includes impressions of, and a score for, South African performance in each area of sustainable settlement. The paper concludes with: (a) a summary of the critical national policy areas that still require policy and strategic achievement to enable successful sustainable human settlements on the ground; and (b) identification of the policies and local strategies that advance or pose risks and threats to the achievement of sustainable settlements.

The paper draws extensively from the content of other papers and publications, which are referred to in the bibliography. The paper's contribution is to provide a total systems contextualization to specific challenges which have been explored in great depth elsewhere.

Global Overview

The *clarion call* for societies and governments world-wide to adopt sustainable economic, environmental and social policies will imply fundamental changes to consumerist lifestyles of their citizens. It has been prompted by a growing realization that the attainment of a decent and quality life for most people on the planet is increasingly being threatened by a blind commitment to economic growth (Jackson, 2009). This call can also influence the way governments and societies plan neighbourhoods and settlements in the future. There is also a radical – albeit minority - view that the planet is already overpopulated and can no longer sustain the energy inputs to the scale of current human settlement, and the waste outputs of these settlements that are poisoning the biosphere.[1]

Many groups ranging from environmentalists, economists, community and political activists and social and natural scientists now recognize that economic growth, as measured by the continuous increase in the rate of expansion in gross domestic products (GDPs) of countries is reaching three separate conditions of limitation: biosphere breakdown due to global warming and toxic waste products (which are the outputs of industrialization); the peaking of oil supplies (which are the main energy inputs driving economic growth); and the financial unsustainability of the global debt system which funds growth (for further details on these conditions of limitation, see appendix 1).

There is a growing literature that identifies debt-driven growth as a *precondition* for the seemingly intractable growing poverty and misery that characterizes the lives of about two-thirds of humanity (Edozien, undated; Hagens, undated; Swilling, 2008). There is also a view that

[1] The logical conclusion of this assumption is that it is imperative for societies to focus on managing the inevitable natural and humanitarian disasters that will happen with greater frequency in the future, as a result of the break down of the biosphere. Therefore, rather than identifying "sustainable development" as the strategic priority, the radical view is to prioritise a series of policies and strategies that try to manage the social chaos that is expected to result from the collapse of many settlements all over the world, through natural phenomena like sea level rise and desertification, as well as create sustainable havens to which a minority could retreat (hence the term "sustainable retreat" as opposed to sustainable development). Regardless of whether one adopts the radical or the more optimistic approach, one needs indicators of progress to the creation of more sustainable human settlements/havens.

while policy changes are critical for enabling changes in human settlement patterns, this should not preclude (or delay) local action, which is urgently needed to demonstrate appropriate human settlement planning and housing delivery.

While many countries and governments – including South Africa - have started adopting new policies and settlement planning practices, there is as yet no effective monitoring of the performance of our and other societies' development towards the creation of human settlements that are more closely aligned with the limits to economic growth. In part this reflects the pro-growth ideology that still dominates the discourse of most governments. This ideology also serves the interest of dominant corporate and financial sector companies whose capital accumulation activities underpin their interest in a growth paradigm. But within the minority view that is critical of this type of growth, the lack of effective monitoring tools for sustainable human settlements reflects the fact that there is as yet no consensus on measurable indicators through which progress towards the goal of sustainable settlements can be gauged. In addition, performance areas within which to measure indication of sustainable settlements have often been narrowly defined around energy efficiency and ecological issues, whereas there are also significant financial and social interventions required.

Defining Sustainability

One of the most widely accepted definitions of sustainable development in the world today states that sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED,1987, Brundtland Report). This definition requires the promotion of values that encourage consumption standards that are within the bounds of the ecologically possible and to which all could reasonably aspire. Some proponents of sustainable development suggest that economic growth must be grounded in contractual arrangements based on limited resource use, i.e. the pursuit of growth subject to environmental constraints (Batie, 1989). But such an idea contradicts the now general recognition that "ultimate limits" exist. At best, it could be argued that growth in per capita consumption of certain basic goods is necessary in certain regions of the world *in the short term* (Lele, 1991). Therefore, the resource maintenance approach has emerged, which emphasises the maintenance of current and future stocks of natural resources rather than continued economic growth. In this approach, minimizing environmental impact and the over-use of natural resources is balanced with meeting the needs of humanity rather than

human desires, which are seen to underlie consumerism (Batie, 1989). The resource maintenance approach makes concern over population growth, survival of species and support for redistributive justice and egalitarian ethics central to human settlement policies.

Within the resource maintenance approach sustainable settlements (or neighbourhoods) are defined as residential or mixed used areas around which people can conveniently walk and which provide a setting for a particular function e.g. as a base for home life, employment, retail activities and so on, where people will often associate particular experiences, hopes and values: i.e. a sense of localness and distinctiveness, of place and of community. According to the United Nations Habitat Agenda (UNCHS, 1996), the sustainability of human settlements entails their balanced geographical distribution or other appropriate distribution in keeping with national conditions, the promotion of economic and social development, human health and education, the conservation of biological diversity and the sustainable use of its components, maintenance of cultural diversity as well as air, water, forest, vegetation and soil qualities at standards sufficient to sustain human life and well-being for future generations. South Africa's Breaking New Ground (NDOH, 2004) sustainable settlement policy defines sustainable human settlements as well-managed entities in which economic growth and social development are in balance with the carrying capacity of the natural systems on which they depend for their existence and result in sustainable development, wealth creation, poverty alleviation and equity.[2]

Sustainable Development: Performance Areas and Indicators

Defining sustainable development in international agreements and country policies, and making changes in the ways we plan and implement human settlements is a good start, but it is arguably not enough to effect successful, long term solutions. We also need to be able to monitor progress towards the goal of sustainable human settlements, for which we need indicators and measurements of sustainability. Sustainability indicators, which are selected parameters or statistics that can measure or represent economic, social and environmental conditions when tracked over time, should have the following characteristics (CMHC 1996):

- Scientific validity and theoretic soundness
- Representation of sustainability issues

[2] The contradiction in BNG is that it assumes that (exponential) economic growth can take place within the carrying capacity of natural systems.

- Evident links between cause and effect
- Responsiveness to change
- Relevancy and the ability to be easily understood by others
- Comparability to targets, thresholds or standards
- Comparability among jurisdictions
- Data availability and reliability
- Ability to integrate social economic and environmental factors

Arguably, the most comprehensive set of indicators developed to date are the Habitat Agenda Indicators, drawn from the United Nations Habitat Agenda, which states that "in order to sustain our global environment and improve the quality of living in our human settlements, we commit ourselves to sustainable patterns of production, consumption, transportation and settlements development; pollution prevention; respect for the carrying capacity of ecosystems; and the preservation of opportunities for future generations" (UNCHS, 1996). As the table on the following page shows, these indicators focus holistically on the planning and development of sustainable neighbourhoods and communities, which took off particularly in the 1990's (Innes and Booher,1999). These indicators attempt to measure neighbourhoods in terms of the form and type of materials used in construction (with the aim of restoring and maintaining harmony between the natural and built environments), as well as the extent to which settlements affirm human dignity and encourage economic equity.[3]

The indicators cover specifically the principles of sustainable development, economic development required to facilitate equitable access to opportunities, resources, and finite ecologically productive space (the successful performance of economically viable industries and

[3] The Vancouver Declaration on Human Settlements and the Vancouver Action Plan (UNCHS, 1976) state that, "…the solutions to the problems of human settlements must be conceived as an integral part of the development process of individual nations and the world community." Guidelines for action recommend that governments and international organisations, "..prepare spatial strategy plans and adopt human settlement policies to guide the socio-economic development efforts (UNCHS, 1976)." The guidelines also state that human settlement policies must be integrated with local industrial policy, land-use policies, infrastructure, services, environmental and cultural preservation, agricultural policy, and social welfare, so they support one another.

In August 2004, UN Habitat established 20 Key Indicators that collate numbers, percentages and measurable ratios for human settlements, 13 Extensive Indicators which collate qualitative data, and 9 check lists which assess more difficult measurable. The check lists provide audited questions for measurements that are not easily measured quantitatively. They are accompanied by check boxes with yes or no responses.

businesses are not measured in terms of profits for a few, but on generating prosperity for all within the finite limits of the biosphere) as well as the comprehensive construction cycle – from the extraction and beneficiation of raw materials, through the planning, design and construction of buildings and infrastructure, until their final deconstruction and management of the resultant waste.

Table 1: List of Habitat Agenda Indicators (UNHSP, 2004)

Habitat-aligned indicators.	
Habitat agenda goals.	**Indicators.**
1. Shelter.	
Promote right to adequate housing.	Key indicator 1: durable structures.
	Key indicator 2: overcrowding.
	Checklist 1: right to adequate housing.
	Extensive indicator 1: housing price and rent to income.
Provide security of tenure.	Key indicator 3: secure tenure.
	Extensive indicator 2: authorized housing.
	Extensive indicator 3: evictions.
Provide equal access to credit.	Check list 2: housing finance.
Provide equal access to land.	Extensive indicator 4: land price to income.
Promote access to basic services.	Key indicator 4: access to safe water.
	Key indicator 5: access to improved sanitation.
	Key indicator 6: connection to services.
2. Social development and eradication of poverty.	
Provide equal opportunities for a safe and healthy life.	Key indicator 7: under-five mortality.
	Key indicator 8: homicides.
	Checklist 3: urban violence.
	Extensive indicator 5: HIV-prevalence.
Promote social integration and support disadvantaged groups.	Key indicator 9: poor households.
Promote gender equality in human settlement development.	Key indicator 10: illiteracy rates.
	Checklist 4: gender inclusion.
	Extensive indicator 6: school enrolment.
	Extensive indicator 7: women councilors.
3. Environmental management.	
Promote geographically balanced settlement structures.	Key indicator 11: urban population growth.
	Key indicator 12: planned settlements.
Manage supply and demand for water in an effective manner.	Key indicator 13: price of water.
	Extensive indicator 8: water consumption.
Reduce urban pollution.	Key indicator 14: wastewater treated.
	Key indicator 15: solid waste disposal.
	Extensive indicator 9: regular solid waste collection.
Prevent disasters and rebuild settlements.	Check list 5: disaster prevention and mitigation instruments.
	Extensive indicator 10: houses in hazardous locations.
Promote effective and environmentally sound transportation systems.	Key indicator 16: travel time.
	Extensive indicator 11: transport modes.
Support mechanisms to prepare and implement	Check list 6: local environmental plans.

local environmental plans and local Agenda 21 initiatives.	
4. Economic development.	
Strengthen small and micro-enterprises, particularly those developed by women.	Key indicator 17: informal employment.
Encourage public-private sector partnership and stimulate productive employment opportunities.	Key indicator 18: city product.
	Key indicator 19: unemployment.
5. Governance.	
Promote decentralisation and strengthen local authorities.	Key indicator 20: local government revenue.
	Check list 7: decentralization.
Encourage and support participation and civic engagement.	Check list 8: citizens' participation.
	Extensive indicator 12: voters' participation.
	Extensive indicator 13: civic associations.
Ensure transparent, accountable and efficient governance of towns, cities and metropolitan areas.	Checklist 9: transparency and accountability.

International trends in the development of sustainability indicators suggest that indicators need to be generated locally so that they reflect local conditions and possibilities, not imposed value systems or conditionalities derived from a global perspective (UNCHS, 1976; Waddell, 1995; Yanarella and Levine, 1992; Innes and Booher,1999). International trends also suggest that change and learning occur in the process of collaboratively developing indicators (Innes and Booher, 1999). While Habitat indicators are meant to provide a comprehensive picture of cities and settlements, they are also meant to be linked with local indicators chosen by individual countries. Despite the fact that these indicators are probably amongst the most exhaustive in the world for planning and measuring sustainable neighbourhoods, they are not used in the South African context. This could partly be due to the fact that Habitat indicators have been developed globally. However, in the South African context, the development of sustainability indicators has not been a pressing need for national policy makers. This may reflect an unwillingness on the part of politicians to be held accountable to stricter methods of measuring performance, or perhaps a concern that performance and monitoring systems could increase the workload of under-capacitated officials.

In the process of developing a local set of indicators it should also be noted that in an industry that consumes fifty per cent of global resources, and that is riddled with complex challenges (including the social, political and economic interests referred to above), it is unlikely that the principles of sustainability and sustainable development can be fully addressed at all times. Balanced and measured trade-offs will often be required in order to find contextual solutions toward more sustainable construction and building of sustainable settlements.

Areas of national policy interventions to facilitate the emergence of sustainable settlements.

The importance of local solutions and initiatives in the planning and creation of sustainable neighbourhoods and settlements is reflected in the type of indicators referred to in the Habitat table: for instance under Environmental Management there are two indicators of the promotion of geographically balanced settlement structures, namely urban population growth and planned settlements. However, underlying these indicators is the assumption that natural, social and economic resources are able to carry the population of the planet and within particular countries. In the absence of national policies which promote sustainable environmental management, sustainable resource use, food security, health and safety, and which speak to population growth, effective spatial planning and the overall economy, localized attempts at planning and implementing sustainable settlements are far less likely to succeed. It is therefore important to delineate critical areas of national policy intervention that would provide an enabling context for local sustainable settlement initiatives. The implementation of these policies and the formulation of strategic plans for their implementation should also be *indicated* so that progress to sustainable settlement policies and planning can be more fully monitored. In this paper an impressionistic scorecard will be used to assess current performance in these areas.

The Role of Agents in Planning and Implementing Sustainable Human Settlements

In the South African policy context, the National Department of Housing's Breaking New Ground (BNG) policy states that the planning and implementation of sustainable human settlements at the local level requires that other national departments and key agents (namely, provincial and local governments, the private sector, NGOs and communities), effectively perform specific functions (NDOH, 2004; NDOH, undated).

In respect of provincial and local government, these functions represent a change from their traditional focus on the mass delivery of subsidized houses to the poor. Now, in terms of BNG, provincial and local governments are required to provide *leadership* (i.e. through providing the vision for human settlement development in provinces, metros and municipalities), to *facilitate* the emergence of sustainable human settlements (through settlement plans, stakeholder consultation, leveraging funding, bulk infrastructure installation, tendering, adjudication, contract management and ongoing service provision) and to *regulate* the structures and land usage

according to defined norms of sustainability (i.e. through building regulations and by-laws). Defining provinces and municipalities as *facilitators* and *enablers* of the overall housing and settlement market is consistent with the BNG imperative to address housing market imbalances in favour of the poor. These imbalances are reflected currently in a split housing market. On the one hand a functioning middle to upper income housing market, with relatively high asset values, functions as a source of property rates revenue for the municipalities. On the other hand the poor majority inhabit municipal-built lower cost housing, for which there is almost no secondary market and which therefore have low property values, resulting in a drain on municipal resources.

These two segments of the housing market are opposite sides of the same coin: the development of gated communities creates an underclass ghetto that is dependent on – as well as excluded from effectively participating in – the formal economy; BNG intends to reverse this imbalance through the creation of integrated, sustainable human settlements. Progress towards correcting this socio-economic imbalance in actual municipal Human Settlement Plans and projects could be monitored under some of the Habitat indicators under categories 2 ("Social development and eradication of poverty") and 3 ("Environmental management"). In this paper the impressionistic scorecard referred to earlier will be used to assess current overall performance in these areas, as well as in other areas that will be explicated later.

BNG envisages private sector development companies (including non-governmental organizations [NGOs]) as the drivers of transaction-based delivery, i.e. developing settlements and building structures on contract for clients, funding the cost of the operations and transferring title to these clients. These developments could include rental accommodation by social housing institutions where the institutions hold the property assets and maintain them. The rationale for the private sector playing this role is that private businesses rather than provincial and local government should effectively and efficiently conclude the transactions that are required to concretely implement the settlement planning and deliver a range of housing and other structures to clients. The effectiveness and efficiencies should be the outcome of market discipline, i.e. private companies will face the risks of under-performance and will have to mitigate these risks.

It is consistent with BNG that individuals and households have the opportunity to invest their own labour (or "sweat equity") in upgrading and maintaining their own properties. Thus the

community sector has a key role to play in the incremental formalization of informal settlements. But the government plays a key role in this through infrastructure upgrade as well as through enabling technical assistance, the provision of building materials and transfer of title to household heads. Thus the indicators covering infrastructure services and household/community involvement are highly relevant.

The abovementioned rationale for the indicators, namely that there are important social and technical processes the implementation of which we need to monitor, is a core argument based on the logical deduction of certain strategies, actions and activities, from higher level policy principles and guidelines. What still needs to be taken into account is the resistance by social classes and other interest groups, who do not subscribe to sustainable settlement policies and principles, to implementing sustainable human settlement strategies.

The political economy of the development of settlements

The functions identified above are *ideal* functions that should be played by the various agents in the government, private and community sectors.

In *theory* the combined effect of these functions *should* produce settlements and housing which are affordable, particularly for the poor, and which in terms of location and proximity to amenities, provide these residents with access to work opportunities and educational, health and commercial facilities.

In *reality*, BNG is perceived as being “owned” by the SA National Department of Housing. Though access to social services, mixed housing typologies, close proximity to economic activity and other features form part of the policy agenda, the Departments of Education, Health, Trade and Industry, Transport and other implicated national government departments neither provide funding for sustainable settlement delivery nor effective collaborative agents who can facilitate the roll out of sustainable settlements.

Moreover, national, provincial and local governments are often spaces of social power that are contested by conflicting interests, and not simply neutral vehicles for the implementation of sustainable settlement policies for the public (citizens). In particular the dominant classes concentrated around finance, property and retail capital, driven by the growth imperative

referred to earlier, represent a powerful force that militates against and undermines the realisation of sustainable, pro-poor human settlement solutions. The most vivid examples of this is the proliferation of gated golf course estates for the rich, gated townhouse developments for middle income earners, and shopping malls along every major transport route, while the poor remain confined to peripherally located and previously segregated housing estates that often lack basic shopping and other amenities that make up the fabric of integrated and sustainable living.

Therefore, until there is a counterforce to dominant class interests in the built environment, it is unlikely that more equitable forms of human settlements for the urban and rural poor will emerge. This counterforce could come from grassroots-based urban social movements. However, they would need to buy in to the type of sustainability indicators referred to earlier in order to be able to contribute to a consensus about the criteria for sustainable settlements. The impact of such organisations would also depend on the permeability of provincial and local governments to their ideas, which could be achieved through electoral power as well as through lobbying and advocacy pressures as well as direct action. The extent of grassroots political power and its ideological discourse could be measured under the Habitat category 5 indicators - the rubric “Governance” make provision for citizen’s participation.

Instruments of sustainable human settlements

The implementation of sustainable human settlement planning and projects happens practically through concrete activities which are required of the work processes of sustainable settlement planning and implementation. These activities are substantially different from the older, more traditional role of provinces and municipalities as regulators and controllers of development, achieved partially through their directly delivering mass quantities of affordable, subsidy housing. To achieve the new objectives that provinces and local governments have in terms of their constitutional and BNG interpreted role as *enablers* of delivery, requires a shift in definition of activities, away from regulation/control activities to project management activities. To achieve this, provinces and local governments will require new instruments. Therefore one of the indicators of sustainable settlement planning and implementation should be the existence of appropriate planning tools. There also should be a reflection of the sustainability of the indicator through a definition of the criteria for credible/sustainable settlement planning, something that takes into account the reality of compromises and trade-offs.

Aligning Habitat Indicators with South African Performance

As the Habitat Agenda suggests, Habitat indicators can be used as a template to align specific national, regional and/or local South African interventions against broad, rigorously determined, holistic indicators that have been developed by a large audience of stakeholders. In light of this recommendation, the following table attempts to compare the Habitat indicators with normative impressions of the South African interventions, and based on this comparison a simple scorecard that assesses South African performance in each indicator in terms of whether the performance is positive for sustainability, puts sustainability at risk or is problematic for sustainability. The information and data in the table is sourced mainly from the bibliographical references (ASPO, 2008a; ASPO, 2008b, Bagale Strategic, 2008; Hendler, 1993; Hendler, *et al*, 2007; Hunter, *et al*, 2008; Mbeki, 2009; NDOH, undated; ODA/Africon, 2007; SA Cities Network, 2007; Steinberg, 2008) and what is regarded as common knowledge in South Africa today (e.g. that the National Prosecuting Authority had prepared to charge the national police commissioner for belonging to a crime racket involving a convicted drug trafficker).

Conclusions

The preceding table indicates that there are six critical national policy and strategic areas that need to be addressed as a matter of urgency in order to unlock the potential for the South African state to create an environment within which sustainable human settlements can take root and – dare we say? – even flourish:

Critical policy interventions:

- ***Macro-economic policy***, which is still focused on growth rather than moving to a steady state economy. Under Trevor Manuel the Ministry and Department of Finance assumed economic growth as the starting point; Manuel has expressed doubts about the *sustainability* of yet more debt-funded rescue packages, but he is at best a doubting Thomas. Pravin Gordhan, the new Finance Minister, is in line with the Zuma administration approach, namely a business-as-usual macroeconomic policy. Notwithstanding the hegemony of economic growth as an ideology, there are alternative macro-economic models that explore conditions of static growth with full employment and narrowing income differentials. There needs to be an openness of mind to exploring these models and their assumptions. Advocates for sustainable human settlement should be exploring these models, as well as the latest thinking around prosperity *without* growth, and fighting to create an alternative voice to be heard by policy makers.

- ***Energy policy***, which still assumes the current economic growth model as being sustainable within current energy limits. Hence South Africa's energy focus has been to lessen dependencies on Middle East oil in the short to medium term and also to develop new sources of oil supply, like from Venezuela. While lessening dependencies makes sense in the short to medium term, it is inadequate as a medium to long term response to dwindling global oil supplies and increased global warming. In the medium term a significant quantum of energy needs will have to be met from renewable energy sources. Various governmental structures and municipalities have renewable energy strategies but the planned quantum of energy that will be produced through wind and solar energy is very limited compared to what needs to be generated - the major long-term supply of electricity to South African industry and households remains coal, and the electricity will be produced through new coal-burning power stations that are already in the process of

being built. While there still appear to be sufficient supplies of coal, burning coal for energy will increase South Africa's carbon footprint and contribute to exacerbating global warming. But even coal is a finite resource and at the projected exponential increase in its usage to achieve six per cent growth, coal supplies will at some point in the future run out.

- ***The public education system***, which impacts on development and therefore has an important determining impact on the emergence of sustainable human settlements, is in a state of disarray. The national budget's allocation to the educational system represents the biggest allocation of all governmental departments. Yet the public educational system is failing dismally to produce the level of educated and trained professionals managers and occupational technicians that would address current labour market needs more effectively, as well as contribute to the formation of a middle class within which a growing number of entrepreneurs with the discipline and vision to succeed, can emerge. There has also been a lack of discipline at many of these schools where reports have emerged of teacher absenteeism, abuse of girl-scholars and intra-pupil violence, the later sometimes with fatal consequences.

- ***Public health system:*** Like education an adequate, affordable, and therefore accessible, public health system is a must-have if there are going to be sustainable human settlements inclusive of the poor. Like the many public schools across the country, many hospitals and clinics either function sub-optimally or have failed to function. Instead of attending to the urgent need of repairing the public health system and addressing issues internal to the functioning of this system, the government is exploring ways of piggy-backing a National Health System (NHS) onto the private health care system, thereby creating extra costs for an already expensive private health system. Repairing the health and educational systems will require a change in mindset by the new administration so that state assets are not easily privatized unless there are compelling reasons to do so, but are seen as public assets and managed accordingly to contribute to the achievement of public goals. The Zuma administration has yet to indicate this type of thinking in respect of the health and educational systems and formulate a public asset turn-around strategy.

- ***Policing/safety and security:*** The breakdown of safety and security mainly for poorer communities, forces them to live with high levels of violence and crime that effectively undermines initiatives to make their settlements more sustainable. The SA Police Service appears to be suffering from a long standing legitimation crisis that undermines the ability of the police to provide safety and security services to the inhabitants of poorer areas. This crisis has deepened over the past 12 to 18 months with the revelations about the extent of corruption at top levels of the police force, crystallized in the relationship of the national police commissioner with the Kebble-Agliotti crime syndicate. Although Selebi has lost his job as commissioner it remains to be seen whether the problem of corruption within the force will be tackled at the highest levels – thus far there is no indication of a serious committed strategy to clean out corrupt police leadership and improve the performance of the service in poorer areas. For many the dismantling of the elite organized-crime fighting unit (Scorpions) indicates that the new administration could in fact be moving in the opposite direction.

- ***Water supply and wastewater treatment:*** basic services (potable water, improved sanitation and electrical reticulation) – since 1994 the percentage of the population living without these services has been drastically reduced as these services were rolled out across the country; there is however a long-term concern with clean water provision and waste disposal/recycling. There is growing concern about the pollution of ground water supplies by the leaching of toxins from mining operations, as well as industrial effluent that is polluting rivers and dams like the Vaal Dam. Added to this is the expected reduction in rain and increase in droughts consequent on climate change. There is generally consensus that South Africa is and will continue to be a water poor country. The landfills and sewerage treatment plants of many municipalities across South Africa are fast reaching their absorption capacity. There is a critical need to introduce recycling to deal with the enormous quantities of dry and wet waste produced. Recycling would have to include neighbourhood and site-based treatment of wet waste. To enable this would require a radical change in how we think about and “see” waste – what we now refer to as waste should in fact be seen as material inputs in a cyclical input/outflow in the biosphere. To make this happen will require new incentives and the ending of the perverse incentives that encourage “waste” and obsolescence. Only the state has the authority to change the rules and introduce incentives for socially positive behavior as well as enforcing these, through clearly outlined water and waste disposal policies that

are implemented at local level. Currently local tiers of government appear to be at best trundling along at a relatively slow pace in formulating policies to address water supply and conservation, and sanitation through waste recycling infrastructure. What is required are strategies and the implementation of these strategies on scale across the country's municipalities.

Sustainability achievements:

Overall South Africa's most positive policies and interventions with respect to sustainable human settlements are in respect of the following indicators:

- Security of tenure – South Africa has a well established system of property rights title registration that is entrenched in law; recent legislation has also extended tenure rights to tenants in relation with fair practices with landlords. This provides a sound framework within which market-based trading and improvement of housing stock can take place. Private tenure also facilitates the emergence of a home owning and an entrepreneurial class and the maintenance of existing property assets.
- Support for indigent households. Through inter-governmental transfers state funds are made available to municipalities in the form of equitable grants. Municipalities can pass this assistance on to households through, for instance, waiving property rates for income-defined owner occupiers. This is a limited social safety net that provides some relief for extremely poor households.
- Extent of women's participation in local government, which is approaching the point at which half of the elected local councilors will be females.
- Sustainable settlement policy – Breaking New Ground represents a conceptual break with past ways of seeing local government functions, by emphasizing the leadership and enablement role that local government should be focusing on instead of simply being the deliverer of welfare housing to the poor. This is step towards sustainable solutions because the focus is to facilitate the emergence of functioning housing markets in previously dysfunctional areas.

Threats to sustainable settlements:

However, against these most positive interventions favouring the emergence of sustainable human settlements, there are several areas where lack of performance appears to be critically undermining/threatening the sustainability of current and future settlements in respect of the following indicators:

- Intergovernmental cooperation and communication – lack of cross-sectoral and interdepartmental planning and collaboration, differing political mandates and agendas, lack of ownership of roles and responsibilities.
- Supply chain management – acquisition of land, new township register, approval of plans, laborious procurement processes, management of contractors, availability of materials, slow delivery rates.
- Funding and finance – national policy assumes that all departments will work together, but not all departments budget together, nor is there enough funding available in housing budgets to roll out what the policy suggests.
- Lack of capacity and need for skills development and training.
- Overcrowding of existing well located land either through mushrooming informal settlements or in the form of overcrowded formal dwellings (which sometimes house between two and four families). The conditions of living are fertile breeding grounds for social pathologies like child and women abuse as well as xenophobia.
- Relationship of price of land to income – relatively high land prices, make housing in favourable locations unaffordable for the poor, who are pushed to the urban periphery where they experience extreme marginalisation. This marginalization, effected through locking the poor up in dormitory ghettoes, feeds into the social pathologies referred to above.
- Inappropriate spatial planning practices by local governments and the formal planning professionals, that reproduce historical social and spatial divisions. The existing planning profession has a material interest in driving grid-like planning processes which militate against the emergence of participative planning, which is truly democratic: the results are often-exhorbitant costs of producing spatial development frameworks and other planning reports, which are increasingly misaligned with real social and economic needs. To effect change in this area will require breaking these practices, the underlying interests of which is to monopolise planning work from municipalities.

- Real limits to citizens' participation in local governance brought on by the demobilization of civic activism as well as the politics of patronage which is now also increasingly practiced at the local level. Political patronage is most evident through councilors' obsession, particularly at election time, with ensuring delivery of low cost housing to their electoral constituencies. The outcome of patronage politics, which is RDP-type houses, works directly against the intentions of BNG.

Potential risks to sustainable settlements:

South Africa's performance with regard to the following of the Habitat Agenda sustainability indicators is satisfactory, except that there is a risk to sustainability either due to too little being done too late or to the unintended effects of an intervention on other indicators:

- Durable structures – South Africa has legislation and regulations governing the quality control on newly built residential structures, as well as the procedures to be followed. However, the means for creating durability might create barriers to entry to building/housing entrepreneurs, household-based home builders and asset development amongst a growing class of South African home owners, by increasing the cost of improving housing stock.
- Right to adequate housing – South Africa's constitution provides settlers with recourse in the event of threatened evictions but also places limits on what and how the state can be expected to provide alternative accommodation. Unfortunately sometimes this has been observed in the breach through the state being able to claim that it simply does not have sufficient resources to devote to housing.
- Evictions – South Africa has legislation balancing the interests of landlord and tenant, aimed to preventing unfair business practices by landlords but also emphasizing the reasonable contractual obligations of tenants. After a bumpy start rental tribunals seem to have achieved a degree of credibility with both private landlords and tenants; the controversies lie with the eviction of tenants and settlers from state properties, like in the Gateway project and informal settlement areas around Durban, where settlers have successfully challenged eviction orders from the government on the grounds that these were violating their constitutional rights. Not all evictions are successfully resisted however.

- Housing finance – South Africa has a series of development financing institutions that align with a well developed housing finance system. This has increased the access of many to housing finance and led to a growth in the number of homeowners in the country. Public funds and private credit also flows to an emerging social rented sector. Accessibility to housing finance still is limited, evidenced by the continuing shortage of adequate housing. Underlying the limits to access is the ever present problem of affordability, which has been further exacerbated in the light of the credit crisis. There is a pressing need for strategic steps in response to this state.
- Food security – for a human settlement to be sustainable the residents of the settlement require nutritious affordable food. Food price inflation has been – and continues to be – significant, outstripping annual salary increases. With unemployment increasing access to affordable nutritious food is diminishing for a major part of the population which spends a significant part of its disposable income on food. Sustainable human settlements therefore require a food security aspect, either through small individual plots or collectively worked commonages that give households in sustainable housing estates an independent source and supply of food, the surpluses of which could be marketed. An interesting case study in this regard is Cuba after the withdrawal of Soviet support (mainly through the stopping of the importation of cheap oil, after the collapse of the Soviet Union).
- Transport modes – although the Department of Transport has identified oil scarcity and pricing as a serious threat, and despite the implementation of Bus Rapid Transport (BRT) systems, there is a view in both local and national government that oil will still be obtainable but at a premium price. This delays the move top electrified public transport systems which could withstand an oil price shock. The move to greater public and less private transport requires buy in from local authorities who are responsible for implementing intra-city public transportation.
- Local government revenue - plans to devolve electricity provision from local governments to other public service providers will undermine local government finances by removing a major source of revenue.
- Local government decentralization – moves to establish a single civil service could detract from local government being able to attract the specialist skills required to strengthen its facilitation of service delivery.
- The emergence but limited impact of civic associations which are starting anew, and lack the coherence and organisational impact of the past. Patronage politics-driven local

government requires pressure from strong grassroots organizations if popular needs are to be met with appropriate policies, because in the current vacuum it is the wealthier and more powerful social classes whose agendas get implemented.

APPENDIX 1: Combined three global sustainability challenges.

The combined effect of the financial un-sustainability of the global debt system, global warming, through its impact on climate change, and the depletion of oil reserves, are material limitations to business-as-usual in the global growth economy. The combined effect of these challenges also poses a threat to the lives and well-being of the majority of people on the planet.

Peak Oil

Oil is a finite, non-renewable resource that must be discovered before it can be produced. Discoveries of oil have been on a declining trend since the 1960s. The evidence from real oil wells (e.g. in the US South and the North Sea) provide empirical evidence that oil production roughly follows a bell shaped curve, rising to a peak and then falling. Approximately two-thirds of the oil producing nations have passed their individual peaks. While it is uncertain precisely when global oil production will peak, and what the post-peak rate of depletion will be, available evidence suggests that global oil production will probably decline between 2007 and 2019, with significant risk of rapid decline and price spikes. Given oil's high energy density, portability and versatility, it appears unlikely that energy substitutes and conservation measures will be sufficient to avert damaging shortages. Because oil is an input into most products (including food and agricultural production) and, in the form of fuel, the basis of the modern transport system, shortages of oil will have significant impacts on the following sectors:

- economy and financial markets – impacts would be price spikes, inflation, recession or depression;
- transport and mobility – likely to be greatly reduced for most people;
- agriculture, food and population – declining food production and rising food prices causing heightened food insecurity;
- geopolitics and conflict – international competition for dwindling oil supplies could spark wars (like the invasions of Afghanistan and Iraq).

To mitigate the effects of oil depletion will require:

- energy efficient transport systems;
- switching to renewable sources of energy;
- changing consumption patterns – lifestyle changes;
- organic and localized urban agriculture – to enhance food security;

- eco-village type of residential development;
- energy efficient buildings – construction methods and materials (Hendler, *et al*, 2007).

Climate Change

The Intergovernmental Panel on Climate Change (IPCC) has identified human activities as the main contributors to climate change, through global warming. The process of identifying the effect of human activities, through the burning of fossil fuels (i.e. oil, coal, etc.), on increasing greenhouse gas emissions, has happened through the modeling of complex natural phenomena (like solar irradiance and volcanism), which appear to be the most significant among a broad range of natural external climate forcings) and through qualitative comparisons suggesting that natural forcings produce too little warming to fully explain the 20th century warming.

The IPCC's conclusions are that continuing population growth and daily human wants lead to an increase of industrial production, energy consumption, and deforestation, thus increasing greenhouse gas emissions and causing global warming. Due to industrial development, concentrations of other greenhouse gases keep growing. Some of these gases have very big global warming potential (GWP), and consequently essential impact on the climatic system. Perfluorcarbons (PFCs) and hydrofluorcarbons (HFCs) belong to the group of such gases.

The anthropogenic activities that contribute the increase in greenhouse gases include :

- burning fossil fuels for power generation;
- transport;
- industry;
- changing land use patterns, especially deforestation;
- agriculture;
- the generation of waste.

Indicators of global warming are:

- icecaps/glaciers melting;
- air/sea temperatures rising;
- increasing frequency and severity of heat waves,
- droughts and storms;

- rising sea levels;
- thermal expansion of the oceans.

The impacts of climate change are:

- threat to food and water security;
- spreading epidemic diseases;
- destruction of coastal settlements;
- displacement of peoples;
- Africa and South Africa are liable to suffer extreme food and water shortages
- the effects of climate change will have devastating impacts on the poor

To mitigate the effects of climate change will require:

- reducing fossil fuel consumption;
- sequestering carbon dioxide emissions;
- reducing deforestation and planting more trees;
- enhancing energy, transport and economic efficiency, and reducing waste;
- improving agricultural practices (to increase oil conservation);
- changing lifestyle and behavioural patterns (Hendler, *et al*, 2007; IPCC, 2007).

Global financial imbalances – an unsustainable global debt system

The global financial system is characterized by severe imbalances between United States (US) debt (as a debtor nation) and over-savings of (mainly) under-developed economies (creditor nations), where the creditor nations are funding the debtor nations. These imbalances are seen by most economists as unsustainable and have recently started to unwind, sparked off by the US sub-prime crisis which has developed into a full blown world-wide credit crisis (i.e. the unavailability of loan funds as banks became almost totally risk averse). Economists differ as to whether the adjustment will be orderly or disorderly – at this point the adjustment is taking the form of a deep global recession that has all the makings of a 1929-type depression, but which governments are trying to avert through making massive injections of money into the global financial system. The risk of further disorderly adjustment is high because of the likelihood of highly indebted US households reducing their consumption expenditure, a continuing sharp fall

in the value of the US dollar and the imposition by the US of protectionist trade control on imports.

The potential outcomes of continuing disorderly adjustment are:

- a drop in global real incomes and output - already the US and Eurozone economies are reflecting significant negative growth rates as they slide into a deep recession;
- volatility in financial markets;
- An oil or climate induced shock could precipitate a further deepening of the recession, and indeed push it into a depression.

To mitigate the effects of adjusting global financial imbalances will require a concerted and coordinated multi-lateral response involving a package of expenditure reducing/increasing policies as well as expenditure switching via exchange rate adjustments. The major developed capitalist countries in the West, like the US and Britain have resorted to increasing public expenditure on lending to, or buying equity in, the major financial institutions in order to shore up the financial system and prevent a complete collapse of the world monetary system. It is not clear whether creditor countries like China and India are willing and able to make the switch from export orientation to developing their internal consumer markets – their GDP outputs have also been hit by declining Western consumption. The current Western governmental response to the credit crisis is to shore up a system of massive debt without a clear strategy to deflate the unsustainable debt bubble that led to the credit crisis in the first place: there is no clear strategy because the unquestioned assumption of most current mainstream economic theory is economic growth.

The combined effect of depletion of global oil and natural gas reserves, climate change and global monetary imbalances and financial instability is likely to have significant impacts on the global and Southern African economies throughout the 21st century. These impacts are likely to include far reaching consequences for energy, food security, settlement patterns and social stability. The risk of ignoring these impacts is far greater than the costs of attending to them now. But to attend to them coherently we need to critique the assumption of exponential growth which underlies our economic growth strategies. If we grow the South African economy at a constant rate of six per cent per annum, after 11 years its size will have doubled and we will have consumed more energy and other resources than we have in our entire history (assuming

no structural change). There is an inherent clash between exponential growth and the finiteness of resources, including the supply of money. Our quantum of physical resources is limited by the planet's finite size. Our consumption of these resources is accelerating. The money supply is ultimately limited by the amount of debt that a minority of people can afford to repay. To sustain our societies will require a paradigm shift from exponential growth to sustainable development through the utilisation of renewable resources and a change in consumption patterns. To achieve this will require new planning approaches to enable the creation of self-sustaining urban communities where living and work spaces are integrated, including eco-villages, and where food supply is restructured (Hendler, *et al*, 2007).

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