The Housing / Human Settlements Atlas series: continued support towards more sustainable human settlements

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Abstract

The National Department of Human Settlements has contracted the CSIR Built Environment Unit in the development of the Human Settlements Atlas (previously Housing Atlas) series. The overall aim of the series is to provide a spatial interpretation of current policy as it relates to the establishment of sustainable human settlements and specifically settlement locality. The objective of the Housing / Human Settlements Atlas series is to guide housing / settlement investment decisions by various stakeholders, from a very dysfunctional, inequitable space economy, towards more sustainable human settlements.

The first two editions of the National Housing Spatial Investment Potential Atlas were published in 2002 and 2005 respectively. The third edition, the Sustainable Human Settlements: Investment Potential Atlas followed in 2009. It presented an analysis of the South African space economy, with a specific focus on (1) the potential of different areas to contribute to sustainable livelihoods of people - quality of life - which is set in the context of (2) the potential of different areas to contribute to sustainable physical environments - quality of place. The outcome of the spatial analysis was a human settlements investment potential profile, to provide an answer to the key question of what (shelter type or model and supportive services) should be built where (in the most suitable location with the highest potential to support sustainable human settlements). The investment potential profile indicator has also been included in the national allocation formula of housing funds to provinces since 2005.

The approach and focus of each of the editions in the series will be presented in this paper, with the emphasis on the intended and achieved impact and the enhancements made to the most recent edition, in order to, amongst others, remain relevant in a more holistic human settlements policy context.

1. Background and introduction

In South Africa, the sustainable delivery of shelter and services is a key challenge faced by the developmental state. This has been highlighted again in the 2009 Medium Term Strategic Framework of government, where national priorities such as ensuring the creation of sustainable livelihoods, building sustainable communities and developing economic and social infrastructure remain on the developmental agenda. Addressing these priorities requires inputs ranging from fiscal resources to the management of implementation. One of the critical inputs towards sustainable delivery is strategic planning, including resource allocation and investment decisions. In support of this process in the housing and settlements arena, the National Department of Human Settlements (formerly the National Department of Housing) has, in partnership with CSIR Built Environment, developed the Housing / Human Settlements Atlas series, first published in 2002. The overall aim of the series is to provide a spatial interpretation of current policy as it relates to the establishment of sustainable human settlements and specifically settlement locality. The

1

intended impact is to guide housing / settlement investment decisions by various stakeholders, from a very dysfunctional, inequitable space economy, towards more sustainable human settlements.

The Housing Atlas series was originally conceptualised as part of a socio-economic information product developed by the CSIR, namely IDEA2000. The IDEA2000 product provided a range of socio-economic data intended to support decision makers in the development arena, but with the "primary intention to provide comparable information for use in the preparation of Provincial Housing Development Plans" (NDOH 2002). The first Housing Atlas of 2002, as well as the subsequent editions of 2005 and 2009, was primarily intended to provide decision makers with an analysis of the national space economy to give an indication of the most suitable locations for housing investment.

In order to define different levels of investment potential, the first edition related the concept of housing need to various determinants of location suitability (e.g. economic potential, environmental suitability, accessibility, etc.). Indications were given of the suitability of areas for different types of development, ranging from formal settlement development to urban regeneration and basic service provision. The second edition built on this analysis framework, but more overtly focused on (1) the concept of sustainable human settlements and (2) the organising concepts of 'need' and 'potential' as defined in the National Spatial Development Perspective published by The Presidency in 2003. The 2009 edition expanded on the concept of sustainable human settlements, and analysed the potential of different localities to support sustainable human settlements according to a more detailed and nuanced set of spatial indicators. The outcome was recommendations on differentiated investment in housing types and supportive services in localities with different levels of potential.

In this paper a success story of knowledge transfer in support of national development priorities will be presented. It will be illustrated how the outcomes of multi-disciplinary research and specialist technical competencies have been applied to produce a planning and decision-support product series. It will also be illustrated how such outcomes and competencies have been packaged in a useable format to support decision-making by end-users in government, and how it is being used.

The paper will commence with a short overview of the typical spatial / locational challenges that the Atlas series aims to address. This will be followed by a description of the approach, analysis and results contained in the various editions of the Atlas with special emphasis on the value additions in the 2009 edition. The intended and achieved impact of the series will be described in closure, as well as some suggestions regarding the focus of future work.

2. The challenge: housing in the context of sustainable human settlements
In spite of significant investment in affordable or low-income housing, the need for housing for low-income households remains high, with official sources estimating the number of units needed at close to two million (NDHS 2009). In addition to the historical 'housing backlog', trends such as population growth, migration and diminishing size of households further increase the need for housing units. The quantitative dimension of this challenge, coupled with the delivery of basic and social services, is however only part of the bigger reality.

Historical spatial investment patterns in infrastructure and housing resulted in specific settlement and daily use patterns that create a dysfunctional, inefficient and inequitable space economy. Many spatial challenges remain, which constrain attempts towards the creation of more sustainable settlements. The main spatial challenges in South Africa centre on the continued spatial exclusion of the poor from the main socio-economic fabric of cities and regions. For example, Goebel (2007 in NDHS 2009) summarises existing South African studies and identifies several locational challenges, including:
- The location of new low-cost houses on the urban periphery
- The sale or rental of RDP houses on the periphery with owners returning to informal settlements that are closer to economic activities
- The cost of transport from new townships to job or income-generating opportunities

- Environmental concerns related to new housing developments on the periphery, including increased vehicular traffic caused by urban sprawl and land-use changes.

As a policy response to these challenges among others, the Comprehensive Plan for Sustainable Human Settlements, popularly known as "Breaking New Ground" (BNG), has been adopted in 2004 as the key national policy document to set the direction for the role of the state in the housing market. The most significant concepts contained therein regarding the establishment of sustainable human settlements are (as summarised in NDHS 2009):

- Demand-responsive differentiated housing delivery: it suggests moving from a "commoditised focus of housing delivery toward more responsive mechanisms which addressed the multi-dimensional needs of sustainable human settlements".
- Holistic view of housing market: it proposed to expand the scope of the State's housing mandate, and emphasises the role of the State in supporting the entire residential property market, e.g. support beyond the housing subsidies.
- Social and economic infrastructure: in line with its approach to develop sustainable human settlements, BNG propagates moving away from a "housing-only approach" towards the development of social and economic infrastructure as an integral part of settlement.
- Spatial restructuring: BNG recognises the important role of housing delivery in spatial restructuring, by means of measures such as promoting integration and the densification of urban residential areas and the progressive eradication of informal settlements, by either the in-situ upgrading of settlements in desired locations by giving preference to social housing (medium-density) solutions, or the relocation of settlements where development is not possible or desirable.

BNG sets a clear policy direction towards a holistic approach to the provision of housing in the context of sustainable human settlements, with a strong spatial or locational component. In terms of implementation, the challenge of including this locational component in investment decisions remains a complex, multi-faceted consideration to be made by decision makers and practitioners in all spheres of government.

3. A response: the Housing / Human Settlements Atlas series
In this section it will be illustrated how, with the conceptualisation of the Housing / Human Settlements Atlas series, significant progress was made to provide insight into the question of where the optimum localities would be for state housing investment that would redress spatial inequalities and ensure that beneficiaries of housing programmes have access to services, amenities and employment opportunities. It will be showed how this search for optimum localities matured into a more nuanced view of the different levels of 'potential' of localities to support sustainable human settlements, and the contributing factors to this potential that are present or absent in specific localities.

3.1 National Housing Spatial Investment Potential Atlas, 2002
The National Housing Spatial Investment Potential Atlas, 2002 incorporated aspects of housing need, location suitability, existing settlement patterns, economic base and housing type into a series of indices to give an indication of the most suitable locations for housing investment. The purpose of the 2002 edition of the Atlas was firstly, to collect and make available relevant socio-economic data in the form of a CD product (IDEA2000), and secondly, to integrate IDEA2000 with other information pertaining to housing need, location suitability and settlement type in view of developing a national-level housing-related decision support tool. This tool was intended to assist national housing decision-makers to make evidence-based decisions regarding housing investment location in support of spatial integration and sustainability principles.

Data were integrated using a set of sustainability principles ensuring that the economic, social and biophysical realms are in balance; and a set of normative principles focusing on providing housing to the poor, redressing the spatial legacy of apartheid and creating multi-functional residential environments where residents can live, work and access social, economic and other infrastructure whilst at the same time protecting the environment. Housing instruments and related land and development policy were

assessed to inform the criteria to be used for the compilation of the spatial indices. Data were analysed by using different methods such as GIS-based raster analysis, multi-criteria evaluation and fuzzy logic to lead to a series of maps indicating the most suitable locations for a range of investment interventions.

The main findings of the 2002 edition of the Atlas were as follows:

1	Housing Need Index	Formulated on the basis of the criteria for budget allocations as per Section 12 of the Housing Act- backlog and eligibility, and also the more recent housing allocation formula, which emphasises the number of inadequate dwellings as a significant indicator of need.
2	Economic Potential Index	Derived from Gross Geographic Product (GGP) 2000, work opportunities 2000, GGP trend 1990 to 2000, work opportunity trend 1990 to 2000, comparative advantage and sectoral diversity.
3	Environmental Suitability	Combination of geotechnical suitability, environmental suitability and agricultural potential.
4	Accessibility	Combination of general accessibility indicated by road supply and access to health care.
5	Infrastructure Capacity	Determined from water capacity and access to the primary electricity grid.
6	Location Suitability	Combination of (2), (3), (4) and (5)
7	Investment Location Suitability	Formulated from (1) and (6) and was determined through a combination or overlay of the "demand" for housing, on the one hand, and on the other, the suitability of land "supply" for housing. The "demand" as captured in the housing need index (1) incorporated aspects of affordability, new household formation, constitutional eligibility, population size and trends, inadequate housing levels and subsidised housing applications.

Table 1: Analysis and outputs, 2002 edition

Following through the set of normative principles which provide the guiding philosophy for what is considered "suitable" and/or of higher "potential", areas where high location suitability and high levels of need intercept were considered to be areas of high potential and most suitable for subsidised housing investment (see Figure 1 below).
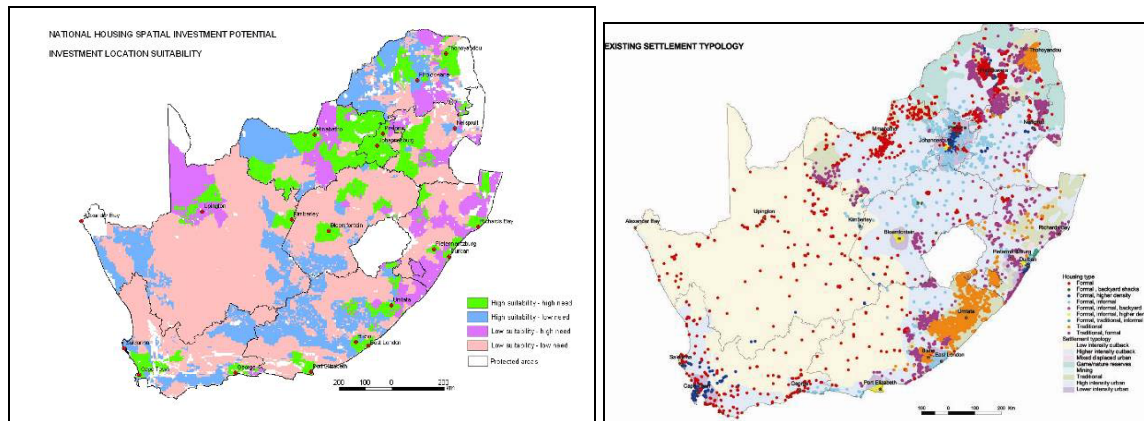

Figure 1: Investment location suitability as identified in the 2002 edition of the Atlas, as well as the existing settlement typology.

A further output was a settlement typology, using as input the existing settlements pattern with its associated housing type characteristics. An adapted structural analysis classifying the economic base of settlements (e.g. commercial farming, nature reserves and urban settlements among others) was used, together with a settlement housing type classification, to derive the settlement typology as shown in Figure 1 above.

The National Spatial Housing Investment Potential Atlas 2002 was produced as a hard-copy document containing the results of the spatial analysis, supported by the IDEA2000 spatial data decision-support

CD. The results published in the 2002 Atlas gave a clear indication of the most suitable localities (informed by housing need and location suitability) for the most suitable types of housing investment interventions (informed by existing settlement characteristics and possible intervention types).

3.2 National Housing Spatial Investment Potential Atlas, 2005
The National Housing Spatial Investment Potential Atlas, 2005 was the second edition of the series. The atlas guides housing investment on the basis of location suitability with an emphasis on (1) the concept of sustainable human settlements and (2) the concepts of 'need' and 'potential'.

The 2005 Atlas was in response to two new policies that influenced the foundation of thinking around infrastructure and specifically housing investment decisions. The 2005 Atlas was based on the 2003 National Spatial Development Perspective (NSDP) principles that stressed the importance of infrastructure investment in localities where there is an overlap between need in terms of poverty, and demonstrated economic potential. The Comprehensive Plan for Sustainable Human Settlements or BNG also influenced the 2005 Atlas by emphasising demand-responsive, differentiated investment strategies, arguing that different spaces require different housing investment responses. Both these policies introduced the concepts of better livelihoods potential and the development of more sustainable settlements.

The 2005 Atlas replaced the focus of location suitability with strategic spatial differentiated housing investment potential to ensure:
1. alignment with the NSDP principles of economic potential and need,
2. the provision of spatial guidance and input towards national resource allocation, and
3. the development of a spatial information resource that can be used in housing and sustainable settlement planning.

The spatial indices created using a series of data informants (or information layers) were guided by a set of core spatial principles aligned with the NSDP and BNG objectives. These spatial principles included the consideration of spatial economic concentrations and the integration of various economic areas, the balance of the carrying capacity of ecosystems, the principles of different investment choices, density and diversity of settlements, and the potential offered by the clustering of facilities.

Five key data informants were used to compile the aggregated indices of housing need and development potential that were spatially presented at local municipality level. These were:

Housing Need	The aggregated housing need index was compiled considering both the existing patterns of inadequately housed households (tenure status and housing needs in subsidies bands) and trends (migration patterns and estimated projected impact of HIV/AIDS).	
Economic Potential	This was the predominant factor in the development potential index and included static 2003 Gross Value Added (GVA) and employment data as well as 1996-2003 GVA and employment trends.	Combined into Development Potential Index
Livelihoods Potential	This informant was based on natural (water, agriculture potential, geotechnical suitability), physical (physical access to schools, police stations and access to municipal infrastructure) and human capital (education levels and crime rates).	
Environmental Constraints	Sensitive areas not suitable for development due to protection of ecosystems for long-term sustainability were identified.	
Land supply opportunities and constraints	These included state-owned land and large conservation areas.	

Table 2: Analysis and outputs, 2005 edition

Using spatial analysis such as multi-criteria analysis, raster-based weighted overlay and GIS software tools, the two indices of housing need and development potential were created.

The main results of the analysis are represented in two main indices: the overall view of total housing need as defined by the aggregated housing need index, and the development potential index, based on the economic potential, livelihoods potential and environmental constraint data informants (refer to Figure 2 below):
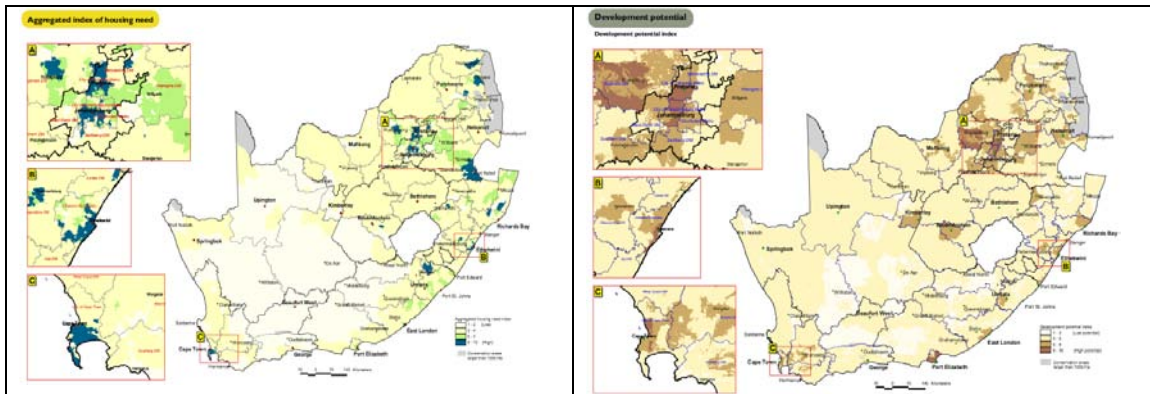

Figure 2: Main Housing Need Index and Development Potential Index, 2005 edition

Subsequent to the publication of the 2005 Atlas, the development potential indicator has been quantified to represent a percentage share per province and has been included as part of the national allocation formula, as discussed in section 4.

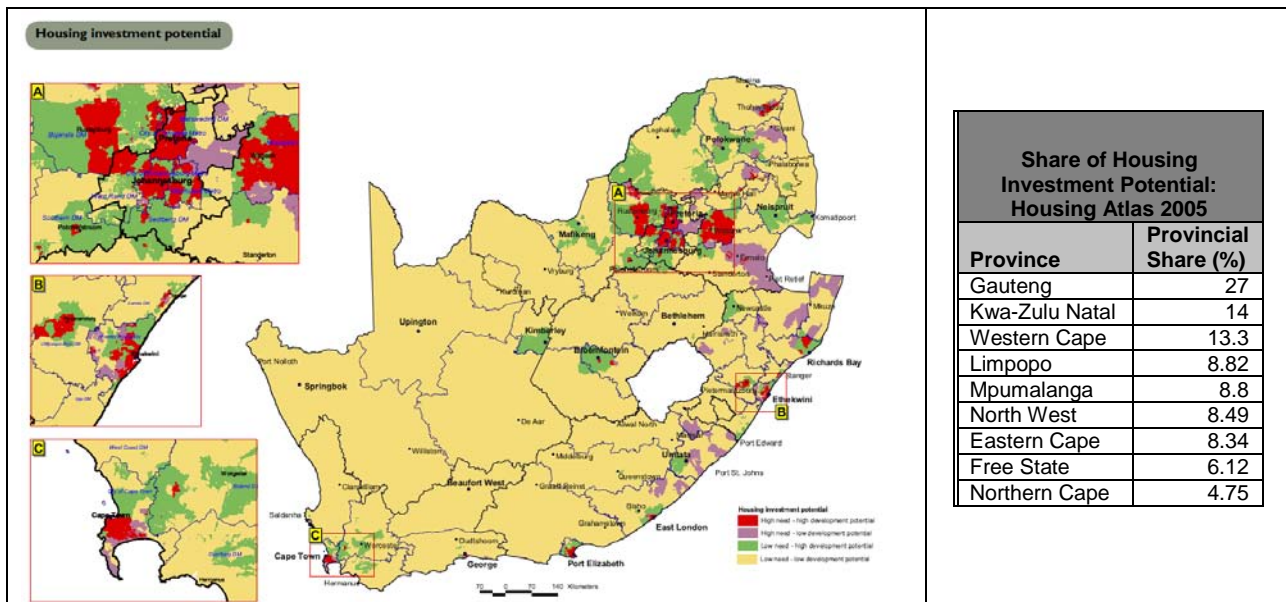| Share of Housing Investment Potential: Housing Atlas 2005	
Province	Provincial Share (%)
Gauteng	27
Kwa-Zulu Natal	14
Western Cape	13.3
Limpopo	8.82
Mpumalanga	8.8
North West	8.49
Eastern Cape	8.34
Free State	6.12
Northern Cape	4.75

Figure 3: Housing Investment Potential and quantified development potential per province, 2005 edition

Overlaying the housing need and development potential indices resulted in four different housing investment typologies, also shown in Figure 3 above:

1	High need and high development potential	These areas offer the highest investment potential. Characterised by medium/high levels of economic potential, medium/high levels of livelihoods potential and medium-high levels of need.
2	High need and low development potential	Areas characterised by low economic potential, low livelihoods potential and medium/high levels of need.
3	Low need and high development	Areas characterised by medium/high economic potential, medium/high

	potential	livelihoods potential and low levels of need.
4	Low need and low development potential	Areas characterised by low economic potential, low livelihoods potential and low levels of need.

Table 3: Investment potential typology, 2005 edition

Investment responses were formulated based on the above typologies, linking the following investment dimensions to specific localities:

- Overall investment focus in terms of NSDP (i.e. fixed or capital investment in the specific locality, or investment in empowering people in terms of skills, social transfers, etc.)
- Priority of investment response (highest to lowest)
- Level of service investment (e.g. high level of service investment and maintenance, basic services, etc.)
- Housing instruments (government housing programmes)

The final product was packaged as a hard-copy document containing maps showing the results of the analysis, final indices, and the responses per locality. An electronic document and map viewer was published on the official website of the then National Department of Housing.

3.3 Sustainable Human Settlements: Investment Potential Atlas, 2009
During the course of the development of the third edition of the Atlas series, the National Department of Housing formally became known as the National Department of Human Settlements, aptly reflecting an increasingly strong policy focus on the provision of housing / shelter in the context of the integrated development of sustainable human settlements. The third edition of the Atlas was renamed the Sustainable Human Settlements: Investment Potential Atlas 2009. The spatial analysis contained in the 2009 edition moved away from the approach of overlaying areas of need for housing and areas of potential, towards a detailed analysis of the national space economy according to the potential of different localities to support the various facets of sustainable human settlements (including the housing / shelter component).

The analysis approach followed in the 2009 edition was to unpack the principles that constitute the concept of 'sustainable human settlements', and to derive spatial indicators from this conceptual framework to enable a spatial analysis of the potential of different localities to support sustainable human settlements. Conceptually, the degree to which a locality can support sustainable human settlements was described in terms of a 'layered approach', focusing on three mutually exclusive inter-dependent levels of analysis – refer to Figure 4. The first level of analysis focused on the potential of people or households to sustain their livelihoods and achieve an acceptable **quality of life** (also in terms of e.g. health and safety) in a specific locality. This would happen in the context of the potential of the physical environment to sustain the needs of people / settlements, referred to as the **quality of place** in the analysis. **Quality of governance** was conceptually included as a third level of analysis, but was excluded from the Atlas due to a lack of reliable data to serve as spatial proxies for the mostly non-spatial governance principles. The principles contained in this framework were further refined into spatial indicators that were in turn populated by a series of data elements. The principles and spatial indicators that were more suitable for national-scale analysis and for which national-scale data were available are highlighted in colour in the diagrams below. Those that were more suitable for local-scale analysis, or where appropriate national data were lacking, were retained in the framework (indicated in grey in the diagrams below), to give direction to users of the Atlas of the supplementary factors they should consider when making settlement investment decisions.

Conceptual Framework – Levels of Analysis
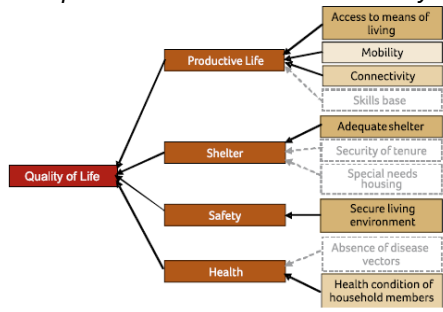
Quality of Life: Spatial Analysis Framework
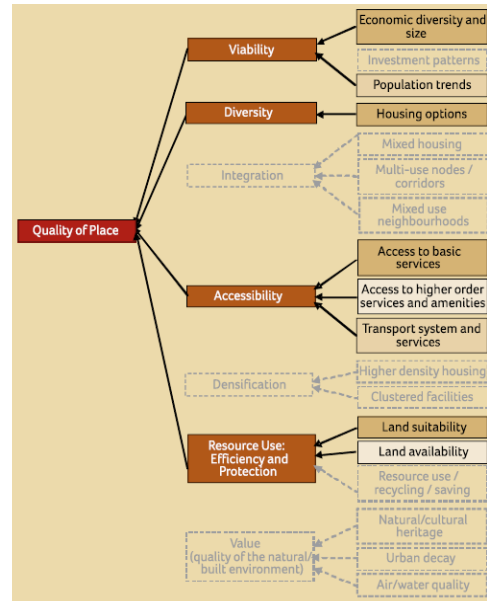
Quality of Place: Spatial Analysis Framework

Figure 4: From conceptual framework to spatial analysis, 2009 edition

The results of the analysis, as well as relevant input data layers that could serve to further inform users about important spatial patterns and trends, were presented in the form of maps. The outcome of the analysis was an indication of the different levels of potential of localities to support sustainable human settlements, in terms of the factors that contribute to quality of life and quality of place respectively.
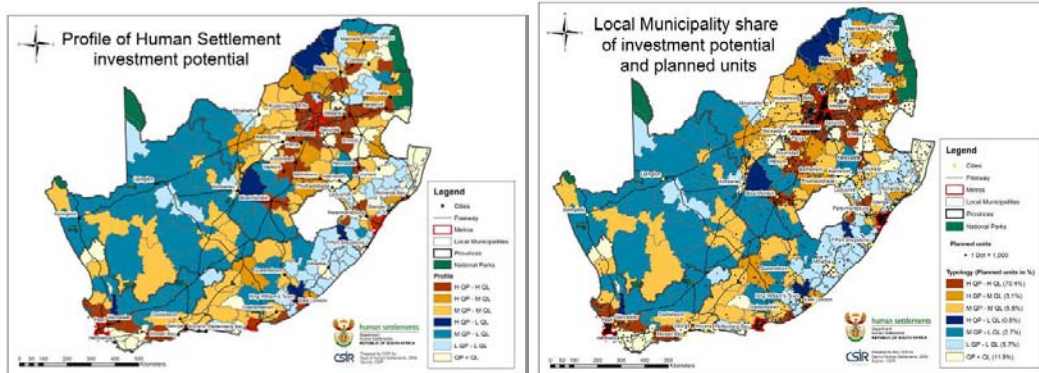

Figure 5: Profile of human settlement investment potential, 2009 edition

This was related to recommendations for differentiated investment responses that would be appropriate for each locality (see discussion in section 4 below).

The 2009 Atlas was again published as a hard-copy document, including analysis results in the form of maps, but also including an exposition on the conceptual framework and a more detailed interpretation of results in an attempt to make the document more user-friendly. The document was supplemented by an interactive map-viewer CD product that could be installed on users' computers and from which relevant maps, tables and text documents could be viewed and downloaded. At the time of writing, the process of publishing the Atlas on the official website of the National Department of Human Settlements was under way.

While justice cannot be done in this paper to the scope of the work covered in the 2009 edition of the Atlas, a few highlights from the analysis, findings and recommendations will be presented in the following section.

Conceptual advances:
The first important achievement was in the multi-disciplinary conceptualisation of the 2009 Atlas, which is the result of successful collaboration between competencies developed in various specialist fields. It built on research and publications in the field of sustainable human settlements, including recent grassroots work on medium-density, mixed-use housing developments. The knowledge generated in this field was successfully transferred to a spatial analysis framework also building on competencies and experience developed in the field of regional planning and spatial economic analysis. The framework was executed using the CSIR's Geospatial Analysis Platform version 2 (GAP2) and the extensive relational spatial analysis capability that was built up over a number of years. The client in turn provided clear guidance on the latest policy developments and user needs to ensure that the end product would be appropriate and applicable not only from a technical point of view, but also in terms of the political / policy environment.

Secondly, the comprehensive and integrated conceptual framework describing the principles supporting sustainable human settlements paved the way for a more nuanced analysis of the 'potential' of areas, and importantly, the factors that limited the potential of specific areas to support the establishment of sustainable human settlements. This paved the way for responses that not only addressed appropriate forms of housing for different localities, but also supportive investment required in those localities. To ensure seamless applicability to a more local scale of analysis, elements to be considered in the local analysis of investment decisions were captured in the conceptual framework, in addition to those considered at national scale.

BNG emphasises that the government has a role to play in the entire housing market, also for example addressing the needs of those that do not qualify for either a subsidised unit or private sector finance ('gap housing'). Where the previous editions of the Atlas focused on housing in the subsidy bands, a start was made in the 2009 edition to consider the housing market in totality. As part of the quality of place analysis, the range of choice of housing options available to different income bands was explored.

Technical advances:
A significant technical value addition was the relational spatial analysis and the more detailed scale of spatial analysis enabled by GAP2. This meant that localities could be analysed at a grain where specific regional clusters of activity or nodes could be identified, and importantly where both local as well as nearby and further away potentials / opportunities could be identified in the form of accessibility analysis and proximity counts (e.g. calculating the relative value of a specific element, e.g. economic activity, in an area based on what is available in the area as well as within a certain travel time or distance from the area). The final indices were calculated at local municipality level to enable the development of quantitative indices at local municipality scale, but much of the supportive analysis was also published at the scale of the 7 by 7 km mesozone. This would also provide a resource to local decision-makers to develop a better spatial understanding of their areas.
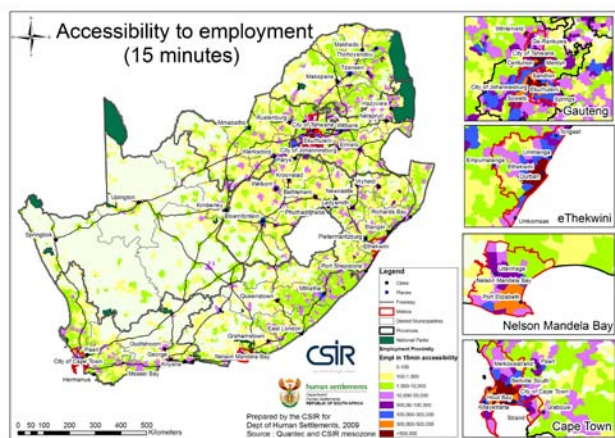
The map is an example of the information layers included in the 2009 edition of the Atlas, and shows accessibility to total employment within 15 minutes travel time as it was in 2007.

Map Description:
Total employment (all sectors, formal and informal, at point of employment) for 2007, that is within 15 minutes travel time on the current road network. Information is indicated per mesozone, a spatial unit of approximately 7 by 7 km^2.

Figure 7: Relational spatial analysis and detailed spatial grain of data, 2009 edition

In addition to the above, the comparability of the GAP2-based information across administrative and natural boundaries enabled the development of a series of nuanced indices that informed the final, overall indices of potential. For example, instead of looking at single measure such as GDP and employment to define economic potential, these concepts were replaced by indicators of economic viability (GDP per capita, constrained for localities where a single economic sector dominates) and access to means of living (relating employment supply to the demand for employment represented by the number of economically active people, and adding grants as a means of living). Various data elements could be compared and, importantly, related to each other, making the analysis more powerful and relevant.

Advances in proposed responses:
The 2009 Atlas contained more detailed differentiated responses than its predecessors. As a first step towards differentiated responses, a broad housing typology was formulated. Different typologies were distinguished based on the dwelling type / built form, density and level of formality, linked also to housing delivery models for state-funded housing.

Type	Dwelling type (built form)	Density	Housing delivery models (for state funded housing)
1	• Single detached (including RDP or privately funded) • Single detached in sustainable eco- or agri-villages • Sustainable eco-estates	Very low (< 20 du/ha)	• Individual subsidies (including non-credit and credit linked) • Consolidated subsidies (including self-built housing – PHP & traditional dwellings) • Rural Subsidies • Provision of Social and Economic facilities Programme
2	• Single detached with backyard shacks • Semi-detached (including RDP or privately funded, e.g. duet houses) • Detached duplexes	Low density (± 30 du/ha – 50 du/ha)	• Individual subsidies (including non-credit and credit linked) • Provision of Social and Economic facilities Programme
3	• Cluster housing • Row or Terrace housing (the above two often in townhouse complexes) • Maisonettes • Detached triplexes • 3-4 storey walk-up apartments (low rise) • Mixed developments (range of dwelling and tenure types)	Medium density (± 50 du/ha – 125 du/ ha)	• Institutional subsidies (including social housing) • Integrated Residential Development Programme (RDP) • Informal settlement upgrading programme
4	• Medium rise stacked units (5-10 stores) • High rise (slab block) apartment (10-20 storeys)	High density (± 125 du/ha – 250 du/ha)	• Institutional subsidies • Local Better Building programmes (at local government level)
5*	• High rise point block apartment (< 20 storeys)	Very high (< 250 du/ha)	

Table 4: Extract from housing typology (excluding level of formality), 2009 edition

These typologies and other supportive investments and comments were related to the investment potential profile of different areas in the country. To illustrate the nature of the differentiated responses, the following examples are provided. Important to note is that the concepts of 'quality of place' and 'quality of life' were retained as separate indicators, and a final typology of potential was generated based on the different combinations of these. Table 5 shows the 'highest' potential areas:

Location	Description	Housing Investment
Areas where a relatively high quality of place is complemented by a relatively high quality of life		
1 - Areas with a high Quality of Place and a high Quality of Life:		

Main concentrations:
• The four main metropolitan areas and surrounds (most of Gauteng, Cape Town and surrounds including Paarl and Worcester areas, eThekwini, Nelson Mandela Bay).
• A selection of secondary cities and major towns: Middelburg; Secunda; Nelspruit / Hazyview; Sasolburg; Bloemfontein; Welkom; Polokwane; Makhado; Potchefstroom; East London / King Williams Town; Richards Bay; George;
 	
Other areas:
• Area surrounding Albertinia & Riversdale to west of Mosselbay (along N2) in the Western Cape;
• Area surrounding Howick and to north west of Pietermaritzburg (along N3) in KwaZulu Natal.
• Area surrounding Phalaborwa next to the Kruger National Park
	These areas are relatively the best off in terms of the majority of indicators included in the Atlas. In spite of large populations, these areas have the highest levels of economic activity, mostly high levels of access to services and other amenities, good accessibility in terms of the road network. Health and crime conditions are often as bad as in other areas with a lower quality of life, but access to the means to make a productive life in these areas are relatively high and counter the negative factors in the combined index.
	
	Note: some quality of life and quality of place issues still occur in these areas, notably crime, weak health conditions and basic services backlogs.
		Metropolitan areas:
		
		• Type 4 in CBD areas – preference for medium rise blocks as high rise can become problematic in the case of lower income households.
		• Type 3 in inner city areas (e.g. walk-ups) and in suburbs (e.g. row housing, triplexes, cluster developments and mixed developments)
		  o Informal settlement upgrading
		• Type 2 in peripheral urban areas (including semi-detached houses and upgrading of backyard shacks)
		• Type 1, including single detached houses in selective cases, for example in environmentally sensitive areas or eco-estates.
		
		In secondary cities and others:
		
		• Type 3 in inner city and suburban areas (including cluster and row housing and mixed developments)
		  o informal settlement upgrading
		• Type 2 in peripheral areas (including semi-detached houses and upgrading of backyard shacks)

Supportive Service and Infrastructure Investment and Development Spending		
Nodal development along key activity nodes and corridors to support multi-cluster and mixed developments, including mixed land uses, with high levels of infrastructure development along these corridors; especially in the metropolitan areas and secondary cities / large towns. Supportive Investment: High levels of investment in housing should be complemented by equally high levels of investment in appropriate basic services and infrastructure (including public transport) to ensure that a high quality of place is maintained, and that service backlogs are not increased due to increased population and housing development. Equally important is to provide for the increased demand on the education, health and community services sectors. Additional funding may be required for land acquisition in and around metropolitan areas, due to high property values and intensity of development, as well as large percentage of land being in private ownership in these areas.		

Table 5: Areas with highest quality of place and quality of life, 2009 edition

Table 6 points to the case of certain secondary cities / large towns that fulfill the role of local service nodes. In each of these cases, the economic viability index was generally low (e.g. low / declining GDP per capita and / or heavy reliance on a single sector). These areas are however experiencing an influx of population, and are at risk of not being able to support a high quality of life if this is not matched by economic growth and increased provision of services and amenities.

Location	Description	Housing Investment
Areas where the relative quality of life is higher than the relative quality of place (areas that do not fall into one of the above categories):		
7 - Areas where Quality of Place is lower that Quality of Life:		
Areas including Kimberley, Mmabatho, Mthatha, Port Shepstone, Stanger, Vryheid (KZN), Sekhukhune District, Thohoyandou, Mossel Bay and Plettenberg Bay. These areas are often linked to a main town, which seems to be a draw card for population inflow from surrounding areas. (Note – the quality of life in all of these areas are not necessarily high, but is at a higher level than the quality of place for the same area.)	Where these areas include a major town or secondary city, the relative lower quality of place index seems to result from a lower viability index (taking into account economic activity and trends, related to population size and trends). These areas do not have among the highest levels of GDP nationally, and do not show GDP growth (in some cases decline in specific sectors). Yet they all experience population growth, some on an existing high total. In some instances, the high levels of grant payments into these areas raised the productive life index (positively influencing quality of life) slightly above what would be expected based on per capita GDP alone. Also lowering quality of place in many of these areas is lack of access to services. The low viability index in these areas, coupled with population growth, is an early warning that the quality of place and eventually quality of life of these areas are under risk of further decline in future.	• Type 3 – including cluster and row housing and mixed developments ○ 3-4 storey (low rise) apartment blocks in central areas or well-located land ○ informal settlement upgrading • Type 2 – semi-detached houses • Type 1, including single detached houses and assistance with self-built houses ○ Single detached in sustainable eco-or agri-villages • Provision for social and economic facilities Programme

Table 6: 'Early warning' areas (extract from response table), 2009 edition

4. Impact: intended and achieved
Use and distribution:
The intended use of the Sustainable Human Settlements: Investment Potential Atlas, 2009 is to assist the implementers of large-scale state-subsidised (low cost) and affordable housing projects to make well informed investment choices on where to invest, and what form of housing solution should be provided at the specific location. The Atlas is regarded as one of the key elements that inform sustainable human settlement development nationally. Most recently, it has been used as a backdrop for the preparation of a National Department of Human Settlements position paper for World Urban Forum 2010.

Distribution of the Atlas is ongoing - the Atlas has already been distributed to the following key units:
- Planning, Research, M & E, Ministry etc. in the National Department
- Office of the Presidency
- Heads of Provincial Departments of Human Settlements (Project Management Unit/ Research Units in Provinces)
- All Metropolitan Municipalities
- Housing Development Agency
- Habitat for Humanity (Africa and Middle East Office)
- United Nations Library (SA)
- Human Sciences Research Council
- Gauteng City Region Observatory
- Development Bank of Southern Africa

The intention is to further distribute the Atlas to twenty of the larger municipalities and other government departments as well as all housing institutions; sharing it with key developers and role players in the affordable housing environment is also envisaged.

Housing funding allocation:

The allocation formula used to distribute housing / settlement funding from national government to provinces consists of two main elements: A - Housing Need and B - Development Potential.

A - Housing Need is made up of provincial shares of need for adequate housing (i.e. 'backlog' of lack of adequate shelter), population, and poverty (i.e. households earning less than R3501 a month).

B - Development Potential consists of economic growth / potential in addition to provincial share of net migration.

From 2005, the investment potential index generated in the Atlas has been used in the allocation formula as part of the B component, and specifically the economic growth / potential element. In the case of the 2009 Atlas, it was recommended that the Quality of Place index be used in the formula.

User feedback:

It is premature to comment on substantive feedback from users, due to the distribution process only commencing early in 2010; however initial feedback from officials in the National Department of Human Settlements, the relevant ministry as well as other recipients, is very complimentary.

5. Conclusion

The Housing / Human Settlements Atlas series has to date proven to be successful as a planning / decision-support resource. The challenge is to keep the product relevant and appropriate, and also to strive for continuous value addition. Appropriate value additions to be considered for the next edition of the Atlas, which is envisaged for publication around the year 2013, include:

- Updated primary data sources with the release of the 2011 census results
- More data input in terms of tenure forms and housing need and demand in the entire housing sector
- Environmental data input that goes beyond the current suitability analysis, e.g. impact of climate change and community risk and vulnerability analysis.

6. References

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7. Endnote

Contributions to the paper have been made by all three authors, who were members of the team who compiled the 2009 Atlas.

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