Backyard housing in Gauteng: An analysis of spatial dynamics

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Abstract

This article examines the phenomenon of backyard housing in Gauteng, a prominent driver of urban spatial change in South Africa's housing market. Backyard housing in South Africa increasingly attracts the attention of policymakers because of the large number of households that this sector accommodates. Moreover, the role played by backyard housing in the overall small-scale rental-housing sector is significant, particularly in Gauteng where a large proportion of households rent their primary dwelling. Drawing on quantitative geo-demographic data from GeoTerraImage (GTI) (2010), Knowledge Factory's Cluster Plus (2010) as well as StatsSA Census 2011, this article documents the spatial footprint of backyard housing in Gauteng and examines the implications of the findings for infrastructure service planning at the municipal scale.

AGTERPLAASAKKOMMODASIE IN GAUTENG: 'N ANALISE VAN DIE RUIMTELIKE DINAMIKA

Hierdie artikel ondersoek die verskynsel van agterplaasakkomodasie in Gauteng, een van die prominente oorsake van ruimtelike verandering in Suid-Afrika se stedelike behuisingsmark. Agterplaasakkommodasie in Suid-Afrika trek al hoe meer die aandag van beleidmakers weens die groot aantal huishoudings wat in die sektor geakkommodeer word. Bowendien speel agterplaasakkommodasie 'n baie belangrike rol in die algehele kleinskaalse huur-huismark, veral in Gauteng waar 'n groot persentasie van huishousings hul primêre behuising uitverhuur. Deur gebruik te maak van kwantitatiewe ruimtelike geo-demografiese data van GeoTerraImage (GTI) (2010), Knowledge Factory se Cluster Plus (2010) en StatistiekSA se Sensus 2011, dokumenteer hierdie artikel die ruimtelike voetspoor van agterplaasbehuising in Gauteng en bestudeer die implikasies van die bevindinge vir dienstebeplanning op 'n munisipale skaal.

MATLO A KA MORA JARETE GAUTENG: CHEBISISO YA DIPHAPANG TSE NGATA KA HARA MERERO YA DIBAKA TSE KHOLO

Serapa sena se shebana le matlo a ka mora jarete Gauteng, e leng moqhubi a moholo oa diphetoho tsa dibaka tse kholo ka hara thekiso ya matlo Afrika Borwa. Matlo a ka jarete Afrika Borwa a phela a bitsa batho ba sebetsanang le ho theha maano hore ba sebetsane le ona hoba di jarete tse ngata di na l ona. Haholo holo, matlo a ak mora jarete a bapala karolo e bohlokoa karolong ya matlo a hirisoang, haholo holo Gauteng moo beng ba jarete ba hirisang matlo a bona a maholo. Ho tsoa dipatlisisong tse tsoang Geo-Terra Image (GTO) (2010), Knowledge Factory's Cluster Plus (2010) le statSA Census 2011, serapa sena se halisa dibaka tse kholo di amane le matlo a ka moha jarete Gauteng ebile se hlahlobisa ditla morao tsa dipatlisiso tsa merero ya dithulusi tsa ho ntlafatsa teropo ka hara masepala.

1. INTRODUCTION AND BACKGROUND

Backyard housing[1] – more often referred to as 'backyard dwellings' or 'backyard shacks' – is a form of small-scale rental housing provided (mostly informally) by private households in exchange for payment in rent or in kind (Crankshaw, Gilbert & Morris, 2000). Backyard housing is a critical source of affordable rental housing in South African cities and towns, which has been validated by research conducted in other developing cities on the rental housing's prominent role in securing household livelihoods (Crankshaw *et al*., 2000: 854-855; Kumar, 2001: 13; Watson & McCarthy, 1998: 53; Lemanski, 2009: 477-478; Shapurjee & Charlton, 2013; SALGA, 2013). Despite advocacy of affordable rental-housing policy support internationally (Rakodi, 1995: 791; Kumar, 2011: 699-671; UN-HABITAT, 2003: 171-187, 2011: 23-27) and locally (Watson, 1994: 35-41, 2009: 23-25; Gardner, 2009:17-21), backyard housing and the informal rental-housing market more generally have mostly been overlooked in the South African national housing policy. Such a glaring disjuncture between the demand/use of affordable rental housing and the limited state supply and/or support (see Bank, 2007; Lemanski, 2009; Shapurjee, 2010;

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[1] The term 'backyard housing' is used throughout this article and is interchangeable with 'backyard accommodation'. Research on backyard housing has shown varying degrees of housing quality, ranging from rudimentary, 'make-shift' structures to larger, more orderly accommodation (see, for example, Gordon & Nel, 2006; Gardner, 2010; Shapurjee & Charlton, 2013). For this reason, an explicit choice was made to avoid using the term 'backyard shack', which has mainly negative connotations related to its 'informality', and which, research has shown (see Gordon & Nel, 2006: xiii; Shapurjee & Charlton, 2013: 659-660), does not represent the full spectrum of backyard housing typologies.

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Shapurjee & Charlton, 2013,) results in planning and sometimes political contestations. Watson (2003) refers to these aptly as 'conflicting rationalities'.

Lemanski (2009) argues that the origin of backyard housing can be traced back to the late 1960s when backyard housing became a popular choice, due to the halt in house construction for urban Black Africans as well as the prohibition of informal settlements. Waves of urbanisation since the 1970s could not be adequately controlled by the apartheid government, resulting in backyard housing units becoming an even more popular choice in the yards of formal properties in 'planned' townships (see, for example, Crankshaw *et al.,* 2000: 845-853 for a detailed historical account of Soweto's backyards).

Since the advent of democracy in South Africa in 1994, backyard housing has continued to play a fundamental role in absorbing demand for low-income housing as people flooded into urban areas with high aspirations of securing an economic livelihood. Simultaneously, the relaxation of influx controls stimulated the development of 'informal settlements': concentrations of informal housing built illegally (not conforming to by-laws) on available pieces of land. Living conditions in these areas are generally dire, with little access to water, sanitation and electricity. While Lemanski (2009: 473) notes the similarities between informal settlement dwellings and backyard housing, she also predicts the 'perpetuation' of backyard housing because of its preferential access to urban services which tend to be lacking in informal settlements. Furthermore, Lemanski (2009: 480) raises the question of the 'dichotomy' between the government's housing policy objectives and its material outcomes, arguing that South Africa's low-income housing policy's emphasis on home ownership may have inadvertently prompted the growth of backyard housing in state-subsidised low-income housing projects (referred to as 'RDP[2]

settlements' in this article). The result of this unplanned infilling leads to "augmented informality" (Lemanski, 2009: 472) and contributes to the complexities of housing provision and management for poorer households reliant on the state (see Shapurjee, 2010; Shapurjee & Charlton, 2013 for more recent commentary on backyard housing in state-subsidised low-income housing projects in Alexandra, Johannesburg).

The growth of backyard dwellings may also be symptomatic of expanding housing demand in a context where state-subsidised housing delivery is too slow to meet the accommodation needs of the urban poor (Morange, 2002: 6), despite the housing subsidy programme having reached significant milestones.[3] On the other hand, the backyard housing market has responded efficiently to a housing crisis, absorbing demand by providing space to accommodate those individuals or households more suited to rental accommodation,[4] while also providing an income for the landlords. These populations are not uniform, however, and typically comprise younger households, single-headed households, migrants and students (Gardner, 2009: 9).

Since 2012, the City of Johannesburg, the largest metropolitan area in Gauteng (with an estimated population of 3.8 million in 2014), has acknowledged the pervasive presence of backyard housing – and its relative growth

within Johannesburg's Urban Development Boundary – from 2007 to 2011. In 2012, statistics revealed that backyard housing units in the City comprised 270 000 units (City of Johannesburg, 2012). In a context such as Johannesburg, which is experiencing high levels of population and in-migration, the growth of backyard dwellings is partly related to the demand for cheap rental housing.

Given the scale of Johannesburg's informal housing challenge (close to 190 informal settlements and expanding backyard-dwelling numbers), appropriate shelter responses should no longer be aimed at replacing informal with formal. Rather, responses are required to support households *in-situ* and to extend housing tenures as the City acknowledges:

> While host to a significant variety of challenges, informal settlements also play a very specific spatial function in the city. They represent the means by which the most socially and economically disconnected queue for access. In this context, interventions such as the RDP housing allocation system only address, at best, part of the problem. Given the scale of the informally housed population, any medium-term shelter response must include very low cost rental (City of Johannesburg, 2011: 47).

Thus, the effects of backyard infilling can no longer be ignored because of the likely future spatial and land-use planning implications for municipal infrastructure provision and management. Overpopulation, unsanitary housing conditions, disease burdens, the risk of fire and vulnerability to natural hazards are just some of the challenges facing municipalities. In some RDP settlements in Cape Town, for example, the challenges of health burdens associated with increased densification (added to generally poor housing quality and management) are now evident (see Govender, Barnes & Pieper, 2011a: 340-342; 2011b: 35). Until a national policy framework on backyard dwellings is devised, local municipalities will unfortunately bear the brunt of these challenges, and will need to seek effective and innovative ways

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2 After the 'Reconstruction and Development Programme' (in 1994). 'RDP' housing typically refers to a detached or semi-detached house given freely to beneficiaries, with the construction and servicing funded through a state capital subsidy. The release of a new wave of housing policy in 2004 dubbed '*Breaking New Ground' (BNG)* (Department of Housing, 2004) orientates housing delivery towards creating sustainable human settlements. Results are mixed, however, with problems of distant location, low densities and few complementary facilities and amenities.

3 The National Development Plan (2030: 242) estimates that over 3 million state-subsidised housing units (including social rental housing) have been constructed since 1994.

4 Households which prefer backyard housing include those either unwilling or unable to access private formal housing for ownership (either provided by the State or by the private housing market). These households include young couples, single-headed households, students, same-sex couples, economically mobile households and households/individuals who like the flexibility of backyard housing (see Gardner, 2009).

to manage urban growth in the 'backyards'.

Owing to limited spatial analytical research of backyard housing areas at a provincial scale in South Africa (only recently has the Gauteng City Region Observatory [GCRO] released a spatial data set on backyard housing [see GCRO, 2013]) this article positions itself as a quantitative state-of-the-art review of backyard housing in Gauteng. Through the use of geo-referenced spatial data provided by GTI from 2010,[5] this study has three aims, namely:

1. To document the 'footprint' (scale and extent) of backyard housing in Gauteng;
2. To provide a detailed profile of backyard housing 'hotspots' in Gauteng, and
3. To investigate the relationship between backyard housing and socio-economic settlement trends.

2. MOTIVATION FOR THE STUDY

Although substantial empirical work has been done on backyard housing across settlement types in South African cities and towns (see recent studies by Gordon & Nell, 2006: 8; Lemanski, 2009: 475; Shapurjee & Charlton, 2013), very few studies have attempted to document the spatial magnitude of backyard housing, particularly in urban areas. The formation of backyard dwellings, which are privately provided, self-funded, self-built and, to a large extent, unplanned and unregulated, has long-term implications for urban planning and housing policy responses. During the development of the collaborative urban simulation[6]

component of the Department of Science and Technology (DST)-sponsored Integrated Development Planning and Modelling (IPDM) Project in Johannesburg, the project team became acutely aware of the growing magnitude of backyard housing as a major urban structuring phenomenon post 2007 (especially in Gauteng); this resulted in a decision to deepen the understanding of Gauteng's backyard dwellings (first conducting spatial research on the Johannesburg Case Study – see Shapurjee, Le Roux & Coetzee, 2012) by obtaining and analysing spatial data[7] published by GeoTerraImage (GTI) in 2010.

The monitoring of informal housing and of informal settlements, more generally, is critical for planners and municipal decision-makers, because it allows both a spatial grounding of the status quo (the problems to be addressed) as well as the vision and foresight to adopt strategies that can affect change on the ground and over time. The application of remote sensing/high-resolution satellite imagery and Geographical Information Systems (GIS) to monitor informal settlement (land-use) patterns and growth are now being applied widely in developing countries in cities such as Rio de Janeiro, Brazil (Hofmann, Strobl, Blaschke & Kux, 2008) Bangkok, Thailand (Thomson, 2003), Delhi, India (Baud, Kuffer, Pfeffer, Sliuzas & Karuppannan, 2010), Cairo, Egypt (Bullard, 2006), Cape Town (Hofmann, 2001; Abbott & Douglas, 2003) and Soweto, Johannesburg (Busgeeth, Van Den Bergh, Whisken, & Brits, 2008), and also in the context of peri-urban America (see Ward & Peters (2007) for a study on 'colonias' and other 'Informal Homestead Subdivisions'). Spatial methodologies are able to act as a critical bridge between grounded

realities and the corresponding 'sense-making' by planners, researchers and geographers through processes of calculation, interrogation and finally introspection.

Building on such research momentum in advanced spatial analysis, this study aims to profile the backyard housing 'footprint' in Gauteng. The reason for choosing Gauteng as a case study is based on evidence that the province hosts the dominant share of rental housing in the country (Watson, 2009: 5), in which backyard housing features strongly (see also Gauteng City Region Observatory [GCRO], 2013), and that future growth of backyard housing stock is predicted in the broader Gauteng City Region (GCR), alongside population growth and rapid urbanisation. Metropolitan municipalities now agree that facilitating *in situ* service provision in backyard housing areas is required urgently (Ahmad, 2012), while also finally acknowledging the positive benefits of backyard housing for landlords and tenants (Ahmad, 2012). Furthermore, provincial Human Settlement Departments are re-invigorating their rental housing strategies, whilst placing policy focus on supporting small-scale affordable rental housing of which backyard accommodation is the greatest supplier (see, for example, SALGA, 2013). Whilst a revival of affordable rental housing policy in some metropolitan areas is commended, these municipalities generally have a limited grasp of the spatial extent of their backyard housing stock and face human capacity constraints in analysing spatial data sets in the form of GIS shapefiles. However, the largely mining town of Rustenburg, located North West of Gauteng, has been the geographical focal point (case study) for the North West Provincial Department of Human Settlements to devise an informal housing and backyard housing strategy – first, in Rustenburg and, secondly, across urban areas in the province. In 2011, SATPLAN (a Johannesburg planning consultancy) was commissioned to create an 'informal housing spatial dataset' (including backyard housing classifications) so that human

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5   Note: GTI 2010 data set was only released in 2012. For a more accurate reference, we have decided to reference the source data obtained in 2010.

6   Refer to Shapurjee, Le Roux & Coetzee (2012). This study made use of UrbanSim – an open source modelling platform – to model changes in land use over a period of 30 years based on spatial scenarios. As part of a wider DST-sponsored 'Integrated Planning and Development Modelling' (IPDM) project, the Spatial Planning and Systems group at the CSIR has also conducted UrbanSim projects for eThekwini, Nelson Mandela Bay and Gauteng. For the UrbanSim process in the City of Johannesburg, the municipal champion was the Department of Planning and

Facilitation. Refer to <http://stepsa.org> for more information on the IPDM project and for specific details on the UrbanSim component.

7   Spatial data refers to total dwelling counts per land parcel (informal, formal and backyard structures). This spatial data is inferred through the use of high-resolution aerial satellite photography and published as a 'Building Based Land Use Data Set by GTI – with the latest release for Gauteng being published in 2012.

settlement policies and spatial planning policies could respond to informal settlement growth, but also the relative rapid growth of backyard housing in Rustenburg – as is the case in other urban areas in South Africa – across settlement types (formal, semi-formal and informal) as well as across different household income groups within these settlements. This article builds on SATPLAN's (2011) study by examining the spatial/geographic reality of backyard housing in Gauteng at present. The article also comments on household socio-economic characteristics in areas prone to backyard infilling. Given the limited scope of this article, further demographic indicators such as household size, head of house, types of employment, and household age profiles) could not be examined and should be the topic of future research.

Furthermore, this article does not lend itself to a detailed discussion of the implications of backyard housing for housing theory, law and policy. However, the article raises critical issues that can be studied further and that can in future feed into the amendment (what some prefer to call the much-needed 'tweaking') of state-sponsored low-income housing development policy processes, planning, financing and ultimately delivery and management in various contexts (see SALGA, 2013 recommendations for a relevant and context-specific Backyard Housing Framework: Chapter 7: 13-19).

3. METHODOLOGY

This study draws on GTI's (2010) *Growth Indicators©* data set, which is the most up-to-date geo-demographic data set of current land use/building types in Gauteng. However, this data set may not represent the full extent of the 'quantifiable' backyard housing market for various reasons.[8] However, this article aims to present dominant spatial patterns and trends

within the Gauteng context, with the view of highlighting the significance of findings for spatial urban planning and management.

3.1 Drawing inputs from Census 2011 data

In addition to GTI data, Census 2011 data were used as a reference to compare findings across a short time interval (two years) and, if possible, to confirm key spatial patterns in backyard housing distribution. Consideration should be given to the limitations of the data used to present findings in the section below. Backyard housing, in particular, tends to be undercounted in official surveys (see SHF, 2008: 10) and the Census 2011 is no exception. There are also problems with defining backyard dwellings, thus leading to ambiguity in classifications that rely on the presence of 'formality' or 'informality'. Moreover, the methodology[9] used by GTI (2010) to count backyard dwellings using high-resolution satellite imagery is based purely on the ability to identify a secondary dwelling on a single land parcel. This method, therefore, cannot distinguish accurately the real land use relating to a secondary dwelling and if it is indeed used for small-scale rental. In addition, this method cannot account for 'shared accommodation', typically manifested as 'rooms' within houses, informal shacks or within apartments/ flats (see Poulsen, 2010 and Mayson, 2014 for research advocacy of the 'rooms' typology and also for support of the backyard rental market and low-income rental housing sector more generally in South Africa).

3.2 Geo-demographic analysis

Backyard housing is a dynamic housing and urbanisation phenomenon that is played out across a variety of settlement types and locations (SALGA, 2013). This dynamism warrants more detailed profiling of backyard housing hotspots, especially in Gauteng, given the rate and nature

of urbanisation of, and migration to the province. To investigate the relationship between backyard housing hotspots and their underlying socio-economic characteristics, the Knowledge Factory Cluster Plus (2010) data set was used. Based on deeds registries and Census 2001 information, Cluster Plus provides a comprehensive segmentation of households across South Africa into 10 main groups comprising 38 residential clusters (see Figure 1).

Residential clusters are defined by variables such as socio-economic rank (income, property value, education, and occupation), household life stage and dwelling type (size, type, and age of structure) (Knowledge Factory, 2009: 1). Figure 1 shows the distribution of residential clusters, ranging from low-density, high-income settlements to high-density, low-income settlements. For the purpose of this article, the findings reflect briefly on the predominant groups and residential clusters in which backyard housing is located.

4. FINDINGS

4.1 Spatial distribution of backyard housing and informal housing

Figure 3 shows the distribution of informal housing and backyard housing, respectively. It also shows the quantities (total number of backyard dwellings) located on a particular land parcel. At first glance, there is a strong correlation between the spatial distribution of informal housing and backyard housing in Gauteng. However, patterns of informal housing tend to be clustered to the south of the province in key urban localities such as Alexandra, Tembisa, Soweto and Sebokeng. Backyard housing, on the other hand, is more widespread across the province, with hotspots identified in Alexandra, Soweto, Ivory Park and Ebony Park, Tembisa, Orange Farm, Diepsloot, Mamelodi, Soshanguve, Etwatwa and Daveyton, Kathlehong, Atteridgeville and Saulsville. Despite a wider spatial footprint, backyard housing tends to be concentrated in

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8   Reasons include the difficulties in distinguishing backyard housing from other 'secondary' land uses (non-residential), uncertainties in classifying the degree of informality with regard to backyard housing and the fact that backyard housing as a phenomenon is highly dynamic and thus constantly changing in spatial terms.

9   Based on land cadastre information and corresponding ancillary spatial data (for example, points such as data commercial/ office nodes and retail nodes [one example being shopping centres]). Refer to GTI (2010) for more information.
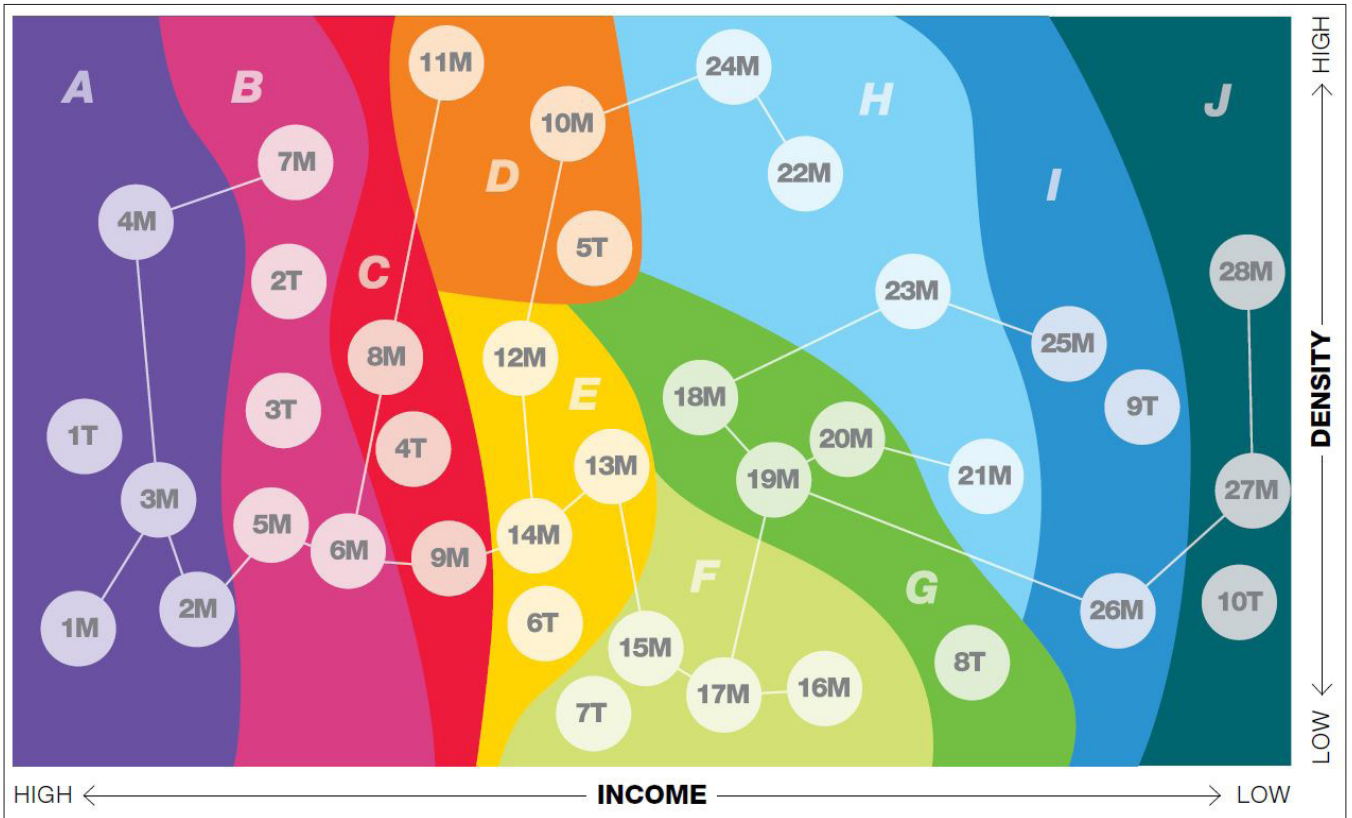
Figure 1: The family tree – showing the density and income characteristics of Knowledge Factory main groups (for example A, B, C, D, etc.) and residential clusters (1M, 2M, 3M, etc.)

Source: Knowledge Factory, n.d: 5 (Note: for a detailed explanation of main groups and 38 residential clusters, please refer to Knowledge Factory Cluster Plus [2009])

GROUP	CLUSTER (M)ETRO & (T)OWN RANGE		GROUP	CLUSTER (M)ETRO & (T)OWN RANGE
SILVER SPOONS	1M Upper Crust 2M Pearl Strings 3M Cheese and Wine 4M Fashion Café Society	1T Big Fish	**NEW BONDS**	15M Bond Battalions 16M Developer's Dream 17M Strugglers Reward 7T Young Blues Town
UPPER MIDDLE CLASS	5M Suburban Bliss 6M Dish and Decoder Set 7M Terracotta Terraces 2T Retreat	3T Platteland Pearls	**TOWNSHIP LIVING**	18M Council's Clutter 19M Kwaito Corners 20M eKasie 8T Basic Town
MIDDLE SUBURBIA	8M Pram Pushers 9M Settled Suburbia 4T Small Town Families		**TOWERING DENSITY**	21M City Strugglers 22M Modest Masala 23M Wilted Neon 24M Tenement Trenches
COMMUNITY NESTS	10M Silver Threads 11M Melting Pot 5T Modest Main Street		**DIRE STRAITS**	25M Chakalaka 26M Poor Neighbours 9T The Other Town
LABOUR POOL	12M Suburban Stagnation 13M Family Street 14M Family Strugglers 5T Rusty Blues Town		**BELOW THE BREADLINE**	27M Tin Town 28M eKaya 10T Forgotten People

Figure 2: The family tree index

Source: Knowledge Factory, n.d: 5

established urban areas especially within the metropolitan municipal contexts.

4.2 Backyard housing settlement trends

As expected, backyard housing is predominantly located in settlements which are characterised by lower average household incomes. Figures 4 and 5 clearly reveal that Knowledge Factory groups G, H, I and J host the predominant share of the province's backyard housing stock.

Knowledge factory group 'G' is classified as Township Living. This is a predominantly low household income group. "The physical environment of this group is the product of the grotesque social engineering of the previous regime. The physical environment has its roots in old council design, with all the embellishment possible by people determined to put their own stamp on the bland originals" (Knowledge Factory, 2009: 6-7).

Knowledge factory group 'H' is classified as Towering Density. This is a predominantly low household income group.

> The clusters in this group are the result of social engineering gone horribly wrong. Crude tenement blocks, low-cost semi-detached council houses and once-proud inner-city blocks that fell victim to decay – all are overcrowded; all are teetering on the brink of social collapse. Teetering, but not yet falling. Thanks to the effort, strength and inspiration of community leaders, Towering Density neighbourhoods have managed to maintain the semblance of community values, despite serious social ills. People living in Towering Density are generally poorly educated, with the result that unemployment levels are high. Incomes are generally low and earned mostly in blue-collar occupations. Demand for social support, such as community clinics and youth programmes, is therefore high (Knowledge Factory, 2009: 6-7).

Knowledge factory group 'I' is classified as Dire Straits. This is a predominantly very low household income group.

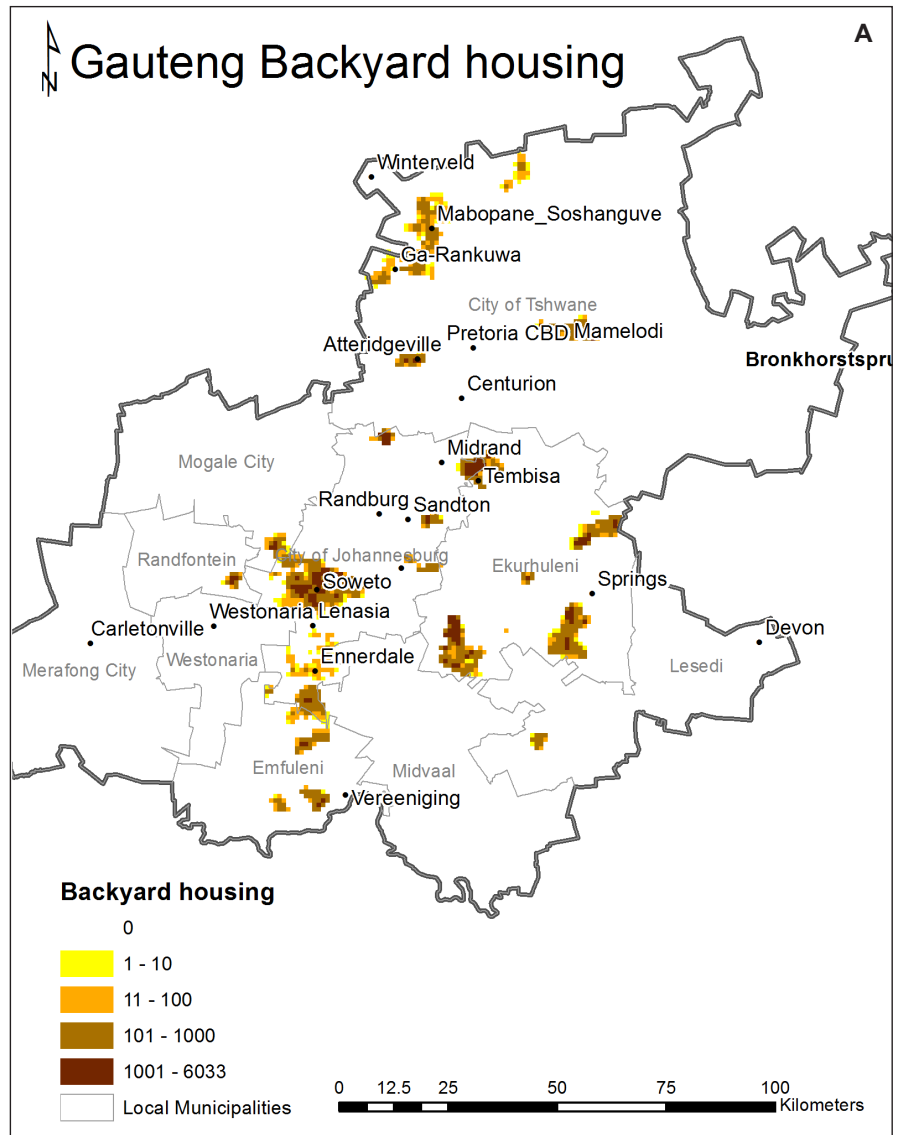> These clusters represent townships bursting at the

Figure 3: Gauteng's backyard housing footprint (A) relative to informal housing (B) distribution

Source: GTI, 2010. Map prepared by CSIR Built Environment, 2013

seams. The local authorities of the previous regime planned Chakalaka and Poor Neighbours clusters as typical township neighbourhoods with four-room matchbox houses and single-sex hostels. Today, the hostels have been converted and every bit of open space is filled with dilapidated shacks, either as free-standing homes or extensions to the original matchbox houses. And all are overcrowded. Naturally this overcrowding places undue pressure on infrastructure and social services. Public facilities such as roads, sewerage and electricity are third-rate or completely lacking. Dwellings are run down and untidy – the presence of so many shacks contributes to a ramshackle, bleak

community. And with very high unemployment levels, inferior education and consequently very low incomes among the minority of unskilled labourers who can find work, this group ranks amongst the poorest in South Africa (Knowledge Factory, 2009: 6-7).

Knowledge factory group 'J' is classified as Below The Breadline. This is a predominantly very low household income group.

> If Dire Straits clusters are the result of inadequate formal planning and insufficient infrastructure, Below the Breadline clusters developed virtually without any formal planning and almost no infrastructure at all. Originally informal settlements of
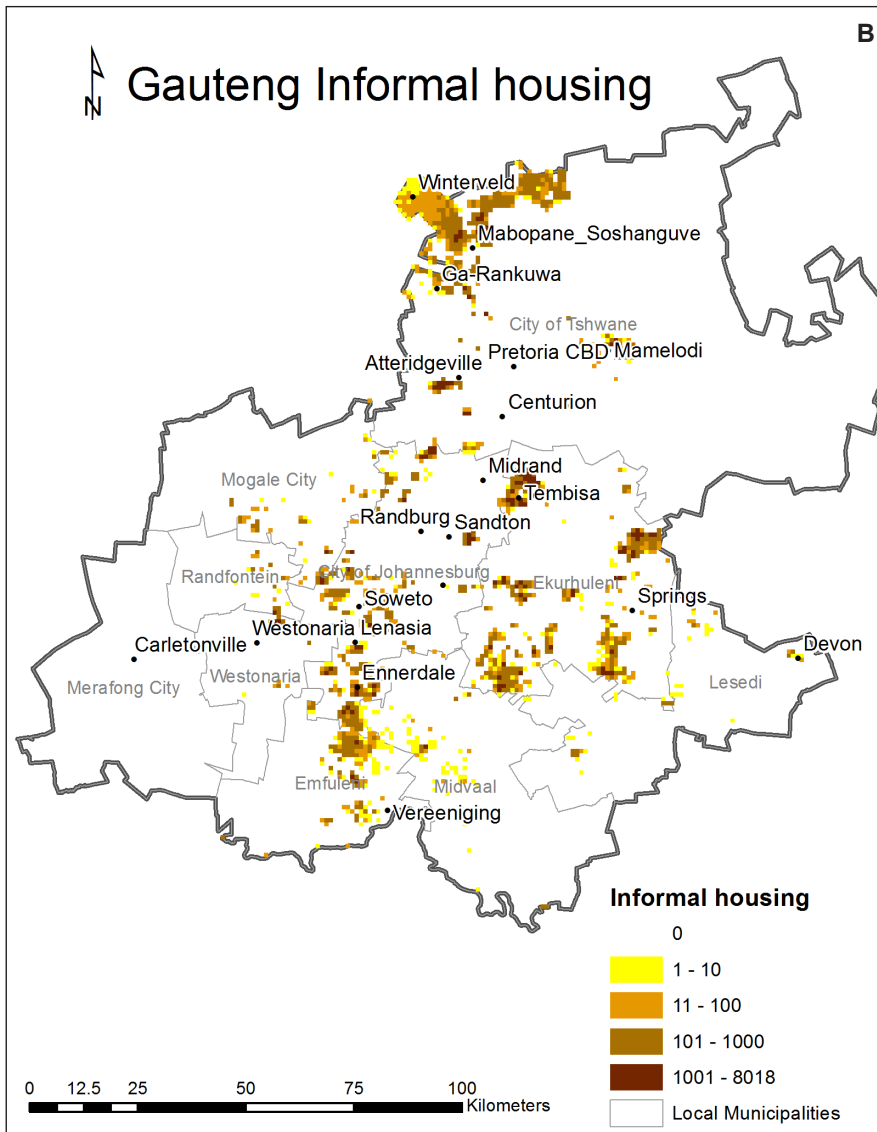
Figure 3: Gauteng's backyard housing footprint (A) relative to informal
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Source: GTI, 2010. Map prepared by CSIR Built Environment, 2013

shacks of varying build quality and size, Below the Breadline clusters are now beginning to benefit from government investment in basic social services such as clinics and schools. Here and there some shacks are also replaced by permanent structures. In fact, one of the stated challenges for South Africa's utility companies is to expand services to this cluster group. Unemployment levels are very high, education very low and incomes at a desperate level. Consequently, community leaders in these clusters fight a desperate battle to keep social ills, such as crime, in check (Knowledge Factory, 2009: 6-7).

4.3 Quantitative characteristics of backyard housing hotspots

Table 1 provides a summary of key indicators of identified backyard housing hotspots. Data are drawn directly from Census 2011 and thus reflect the most up-to-date information with regard to dwelling counts. In terms of dwelling classifications, an important feature of the data is the number of backyard dwellings classified as formal structures. This article is concerned with the aggregate backyard housing footprint and thus analyses the combined backyard housing numbers – both those that are classified as

informal and those that are classified as formal.

According to Table 1, although Soweto has the largest population size of all the backyard housing hotspots, it is also the largest in terms of land area. These two settlement features may reduce immediate density pressures (population and dwelling densities) in the township associated with backyard infilling. In addition, levels of economic growth in Soweto have supported a vibrant secondary housing market, with residents opting to move up rather than out of the township.

By contrast, areas such as Tembisa, Diepsloot, Mamelodi and Atteridgeville are predominantly impoverished (indicated by higher levels of informal dwellings) and also mirror fairly high population densities. Alexandra remains the most dense backyard housing area by virtue of its small size, but also because of the 'business of rental' prominent in this well-located neighbourhood.

Table 1 further reveals that Ivory Park, Ebony Park and Kaalfontein, Tembisa and Diepsloot are areas with the highest proportion of backyard housing (>30%). In Diepsloot, backyard structures even outnumber formal dwellings. In general, the majority of backyard housing hotspots in Gauteng have a greater proportion of backyard dwellings compared with informal dwellings.

In terms of total backyard dwellings, Soweto hosts the lion's share, but this figure may be misleading. Further work is required to determine the level of dwelling qualities across *all* the hotspot areas as well as to measure possible quality-of-life indicators. Documenting the hard backyard numbers is useful, but more needs to be done to contextualise spatial patterns.

5. REFLECTIONS AND CONCLUSION

This article provides a high-level spatial review of an increasingly significant urban growth phenomenon. Backyard housing hotspots in Gauteng are not restricted to one settlement typology,

but rather span a variety of low-income settlements, including infilling in some state-sponsored (RDP) low-income settlements. Although the study did not investigate these areas specifically, it is critical that further research be conducted in these contexts to understand fully the market dynamics as well as the human stories surrounding the supply and demand of RDP backyard housing. Following Lemanski's (2009) and Shapurjee's (2010) research, more qualitative research approaches, including participatory methods/action research, are needed across the urban affordable rental housing continuum (see SALGA, 2013, Executive Summary: i-ix).

Findings have shown that the backyard housing footprint predominates in the metropolitan municipalities of Johannesburg, Ekurhuleni and Tshwane. The City of Johannesburg hosts the majority of Gauteng's backyard housing units (145 737), followed by Ekurhuleni with 102 253. The functional relationship between Johannesburg and Ekurhuleni may account for similar backyard housing numbers. In comparison, backyard housing numbers in Tshwane are considerably lower, with 37 245 units recorded. Overall, the highest proportions of backyard housing are located in Ivory Park, Ebony Park and Kaalfontein, Tembisa and Diepsloot. With relatively high population densities in these areas (160 persons per hectare, 108 persons per hectare and 209 persons per hectare, respectively), backyard housing infilling is likely to have impacts on municipal service capacity, at least in the medium to long term.

The Knowledge Factory residential codes (main groups) and subsidiary residential clusters provide useful household-income indicators for identified backyard housing hotspots in Gauteng. However, further work is required to determine the underlying *varying reasons* for backyard infilling in respective hotspots. In particular, municipal by-laws may need to be investigated (such sentiments are also echoed by SALGA, 2013: Chapter 7: 13-19). Approaches to informality by respective municipalities in Gauteng should also be further researched. In some RDP settlements such as Lehae in the south of Johannesburg, the building of informal backyard structures is prohibited and extensively policed (see, for example, Huchzermeyer, 2009: 65), whereas in other cases backyard accommodation is simply ignored or tolerated. Compounding the problem of this uneven approach towards backyard accommodation is the lack of a uniform housing policy on rental housing. Until a uniform housing policy is forthcoming and mainstreamed without delay into the wider housing discourse in South Africa, efforts to improve backyard housing environments may be stifled (SALGA, 2013: Chapter 5: 1).

The realities of backyard housing in urban agglomerations such as Gauteng may likely pose challenges with regard to healthy living conditions, housing safety standard, housing building standards and the debate around the State's role in facilitating the supply of cheap rental accommodation without displacing the poor through gentrification and thus rental increases imposed on
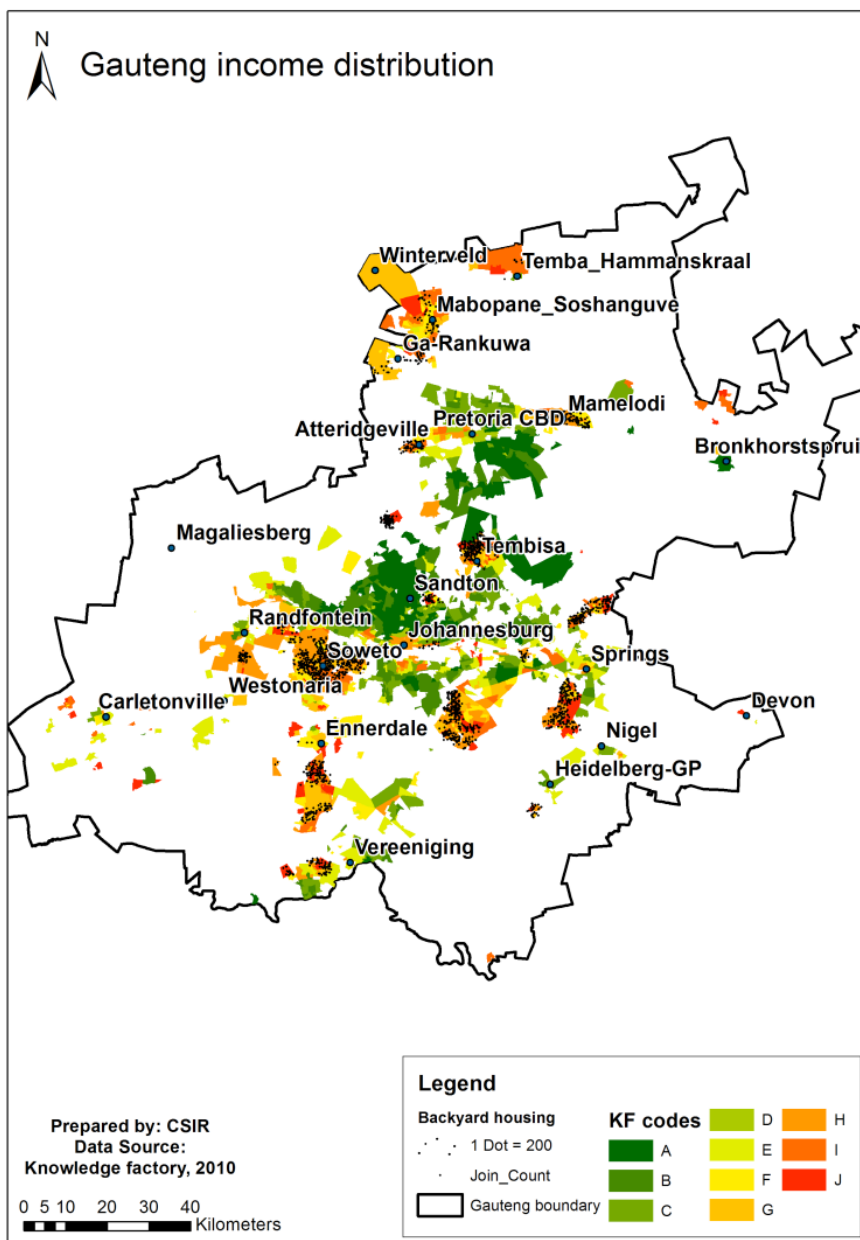

Figure 4: The relationship between backyard housing and Knowledge Factory Codes (also known as 'Main Groups')

Source: Knowledge Factory, 2010; GTI, 2010 (Map prepared by CSIR Built Environment, 2013)

Table 1: Characterising backyard housing hotspots in Gauteng[1]

Indicator	Alexandra	Soweto (excludes SP*)	Ivory Park+ Ebony Park+ Kaalfontein	Tembisa	Diepsloot (excludes Diepsloot AH SP)	Orange Farm+ Drie Ziek+ Stretford	Mamelodi	Soshanguve	Etwatwa + Daveyton	Katlehong	Atteridgeville+ Saulsville
						Backyard housing hotspots					
Settlement size (ha)	691	12875	1580	4280	656	3053	4519	12677	3528	5536	1850
Population size	179624	1241767	252840	463109	137310	173530	334577	403162	279833	407294	169632
Population density (persons per ha)	260	96	160	108	209	57	74	32	79	74	92
No. of informal backyard dwellings	5754	36371	17421	20017	20461	5271	12498	8582	10962	19467	4464
No. of formal dwellings	4651	34929	15862	37903	3827	1190	6850	2507	2244	11660	2344
Total no. of backyard dwellings (informal and formal)	10405	71300	33283	57920	24288	6461	19348	11089	13206	31127	6808
No. of informal dwellings	9622	14454	8181	23836	20045	7047	29723	17766	18484	10636	22306
No. of formal dwellings	42680	255075	49241	82726	17485	34567	60727	75803	46172	81417	24365
No. of other dwellings (traditional, caravan, (other)	1032	3930	1005	1858	606	509	906	1401	1260	1661	407
Total no. of dwellings	63739	344759	91710	166340	62424	48584	110704	106059	79122	124841	53886
Backyard dwellings as % of total number of dwellings	16.32%	20.68%	36.29%	34.82%	38.91%	13.30%	17.48%	10.46%	16.69%	24.93%	12.63%
Ratio of backyard dwellings to formal dwellings	1:4.10	1:3.58	1:1.48	1:1.43	1:0.72	1:5.35	1:3.14	1:6.84	1:3.50	1:2.62	1:3.58
Ratio of backyard dwellings to informal dwellings	1:0.93	1:0.20	1:0.25	1:0.41	1:0.83	1:1.10	1:1.54	1:1.60	1:1.40	1:0.34	1:3.28
KF code prevalence	15, 28	17, 18, 19, 20, 24, 26, 27	18,26,28	17, 19, 20, 24, 26, 28	28	19, 24, 25 27, 28	16, 24, 26	15, 16, 18, 19, 20, 26	16,17,19, 20,24,26, 27	17,19,23, 24,25,26, 27	24,26

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1 Note: boundaries are according to 2011 StatsSA, main place and sub-place. Soweto excludes the following sub-places: Bram Fischerville Ext. 12; South Roodepoort Main Reef areas Gold Mine; Doornkop AH; Stesa AH; Klipspruit Treatment Works; Power Park. Note: backyard dwellings as a percentage of total number of dwellings refers to the proportion of backyard housing units (expressed as a %) in relation to total housing units in a given hotspot (geographical location).

tenants by landlords. Alongside Shapurjee & Charlton (2013) and SALGA (2013), this article suggests that the State play a facilitative role rather than directly intervening in a largely well-functioning housing submarket that is able to generate new housing stock (and rental housing tenure) relatively quickly and relatively cheaply. Thus, support should be given to more responsive and context-specific municipal management of backyard housing and associated spatial planning and land-use management strategies. A positive view of backyard housing is that it meets density objectives, advocated by many metropolitan municipalities in their Spatial Development Frameworks and other strategic plans. Added to densification outcomes, is the multiple re[use] of low-income housing as well as landlords leveraging off spaces in their backyard to provide a means for tenants to gain access

to relatively stable housing tenure, access to formal basic sanitation, water and electricity networks; and also provides opportunities for tenants to build their own rental backyard structures – with the potential to expand and/or renovate their accommodation. For landlords, backyard housing is a vital source of income to vulnerable households which research shows (see Gordon & Nell, 2006) are older, mainly single-headed female households with relatively low incomes, compounded by unstable employment. Crucially, for tenants, on the other hand, "backyard housing serves as vital 'life-lines to diverse urban households, and despite not being an ideal or even accepted form of accommodation is relatively successful" (Shapurjee & Charlton, 2013: 654).

South Africa's backyard phenomenon is complex, multi-layered, challenging and politically contested (Shapurjee

& Charlton, 2013; SALGA, 2013). But such a wide-reaching housing subsector holds value for particular urban households. Municipalities should also note the benefits rather than lament the informality and generally poor housing conditions of some backyard housing units. Thus, municipal planning and management strategies should focus on medium- to long-term basic infrastructure including public transport routes in order to guide the inevitable development of backyard housing in well-located areas over time. Ongoing collection and management of spatial land use and housing data sets, complementing this with a critical analysis of dominant spatial patterns of informal settlements development, emerging backyard housing trends and potentially a temporal/retrospective analysis over a five-year period in order to overlap sustainable human settlement strategies with the integrated (and
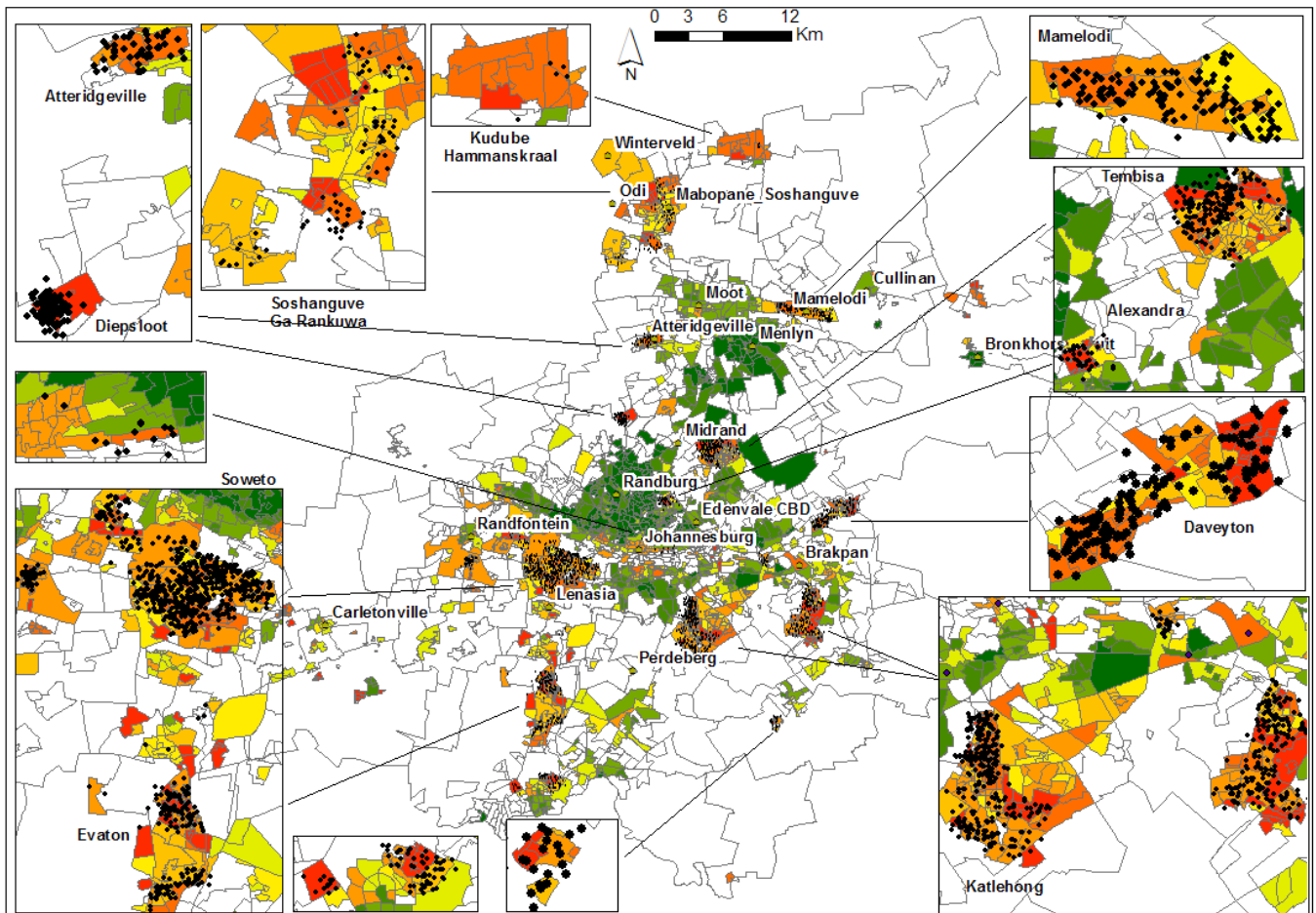

Figure 5:   Zoomed in images of backyard housing in Gauteng

Source: Knowledge Factory, 2010; GTI, 2010 (Map prepared by CSIR Built Environment, 2013)

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spatial) development planning five-year cycle.

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