

# **IDENTIFYING BARRIERS TO URBAN RESIDENTIAL INFRASTRUCTURE DEVELOPMENT: A LITERATURE REVIEW**

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Residential developments should be fully functional and serviced with basic infrastructural facilities in order to be habitable. Despite the importance of housing and basic services, they are a difficult problem for any country. With ever-growing global population and urbanization, existing urban housing infrastructure is insufficient in addressing housing needs in many economies. This paper examines the problem of housing and basic infrastructure delivery and identifies factors which hinder development and eradication of urban residential infrastructure backlogs. A review of literature related to housing and urban development was conducted from published and unpublished literature, based on international and South African context. The study found that barriers to the eradication of the massive housing and basic services backlogs include issues related to governance, incapacity/incompetence, corruption, contradictory policies and systems, stakeholder dynamics, difficult and often cumbersome processes of acquiring critical resources such as land, finance, and political consent/support. By identifying these factors as they relate to urban housing and related infrastructure provision, relevant policies could be designed to help improve housing and basic services delivery.

*Keywords:* economic development, infrastructure delivery, social infrastructure, economic development, residential development

## **1 INTRODUCTION**

Infrastructure plays important roles in the development of cities, improvement in the quality of lives and overall socio-economic development and growth of economies (Brown-Luthango, 2010). Provision of infrastructure meets the community developmental, recreational, social and cultural needs of people in neighborhoods. In this vein, infrastructure could be classified as social, economic and institutional infrastructure (Brown-Luthango, 2010). Social infrastructure comprises services and facilities (including material assets, social and human capital) provided to meet the needs of communities, provide direct and indirect employment, promote social interaction and enhance the quality of life of the citizens of a country (Otero *et al.*, 2014). According to the European Union (EU), social infrastructure helps to ensure sustainable cities and communities, meets the diverse needs of residents, and contributes to a high quality of life (Ponce, 2011). In this context, housing which improves quality of life, alleviates poverty (assists in wealth creation) and enhances social and economic reconstruction of the country as a whole is social infrastructure (Meyer, 2014). In addition, basic infrastructural services such as drainage, water supply, access roads and electricity essentially need to be in place for habitation and residential developments to be sustained. Moreover, as stated

by Tissington (2011), housing is not just about building houses; it is also about providing the residential areas and building communities with closer access to work and social amenities. Moreover, as defined in the South African Housing Act of 1997, housing development is:

*'the establishment and maintenance of habitable, social and sustainable public and private residential environments to ensure viable households and communities in areas allowing convenient access to economic opportunities,...and social amenities in which ...residents will have access to: a) permanent residential structures with secure tenure, ensuring internal and external privacy and providing adequate protection against the elements; and b) potable water, adequate sanitary facilities and domestic energy supply'* (Tissington, *ibid.*)

Residential development is a difficult problem for any country (Liu *et al.*, 2014; Meyer, 2014). With ever-growing global population and urbanization, existing urban housing infrastructure is insufficient in addressing housing needs in many economies. The global urbanisation rate is currently at 54% and is projected to reach 66% by 2050 (United Nations, 2014). Rapid urbanization puts pressure on the existing, but inadequate/insufficient infrastructure. Lack of adequate and well-performing infrastructure holds back economic growth and development (Ehlers, 2014). A considerable, ongoing investment in social infrastructure is therefore needed to accommodate this ever-increasing population and demand for infrastructure.

Today, South Africa still sits with the same size housing backlog it estimated having had in 1994, with a ballpark figure of 3 million households (Financial and Fiscal Commission (FFC), n. d.). A more recent study puts this figure at 2.1 million, affecting approximately 12.5 million people (Meyer, 2014). There are significant needs for social infrastructure provision in South Africa due to this rapid urbanization which has resulted in the burgeoning of slums characterized by shelter camps and informal settlements. This need was reflected in the Medium Term Strategic Framework (MTSF) in 2009 that refers to a "massive programme to build social infrastructure" to cater for the ever-increasing population of the country (Rust and Koen, 2011).

In addition, data on dwelling conditions, which indicates that over 40 percent of renter households live in what could be characterised as slum conditions, points to a significant need for affordable, better quality accommodation (Melzer and Moothilal, 2008; Tissington, 2011). Despite policy adjustments and enormous delivery efforts of states, housing and basic services delivery backlogs still exist (Meyer, 2014; CAHF, 2015). The huge backlogs are also mainly due to the apartheid history (Meyer, 2014). Even with policy adjustments and enormous delivery efforts of states, the housing and basic service delivery backlogs still exist, giving rise to a continuous cycle of poverty. Access to such services is still lacking as was noted by the South African president in his State of the Nation Address in 2011 (Meyer, *ibid.*).

Housing embraces all the social services and utility that goes to make a community or neighbourhood a livable environment (Jiboye, 2011). Houses are fundamental social infrastructure of every country (Mensah *et al.*, 2014). They are one of the basic necessities of life, besides food, clothing and water, serving as a place of abode for thousands of urban dwellers (Mensah *et al.*, 2014; Meyer, 2014).

Lack of provision of adequate housing and related facilities is detrimental to the health and safety of the citizenry (Nwokoro and Onukwube, 2014). For instance, access to clean water is essential for healthy living. Some diseases such as gastroenteritis, diarrhea, typhoid fever and hepatitis are associated with the consumption of poor quality water. Again, inadequate power supply may restrict an individual's ability to practice healthy eating habits related to cooking, washing, food storage etc. and power outages may cause trauma and injury (Nwokoro and Onukwube, 2014). In addition to being detrimental to

health and safety, inadequate provision of housing and supporting infrastructure affects production in the construction industry, as well as the economy at large because production of goods and services in other industries which is mainly driven by infrastructural elements in place. For instance, mining operations in the Eastern limb of the Bushveld Complex are affected due to insufficient housing for workers and inhabitants as well as inadequate provision of basic services (such as water, roads, electricity and sanitation) to support housing (Smith and da Lomba, 2008).

Despite the importance of housing and basic services, it is a seemingly unending concern for any country. What is immediately required is housing that is affordable to households or individuals in the lower-middle income market (the gap market) (CAHF, 2015). Housing programmes have been developed by the Department of Human Settlements to address the housing need of about 70% of South African households (made up of 40% who earn a monthly income of less than R3, 500 and 30% with a combined household income of more than R3500 but who still do not qualify for housing credit through the informal sector) for whom housing finance is not an option (le Roux, 2011). According to Gopalan and Venkataraman (2015), housing affordability is taken as a measure of expenditure on housing to income of an individual or household. It has to meet some form of criteria such as income level, size of dwelling unit or affordability in terms of ratio of house price to annual income (Gopalan and Venkataraman, 2015).

The subject of affordable dwellings and basic infrastructure therefore requires continuous attention. Innovative and potential ways of alleviating housing and basic services delivery backlogs need to be constantly reviewed. Although substantive research has been conducted on housing delivery backlogs, for instance, Emsley *et al.* (2008), Tiwari and Hingorani (2014) and in South Africa, Thellane (2008), Sibiyi *et al.* (2013) and Meyer (2014), it appears that few studies have reviewed current evidence incorporating housing and basic services in identifying potential barriers to alleviating the backlog problems. Thellane (2008) focused on provision of affordable housing. Sibiyi *et al.*'s study dwelt on barriers to upgrading informal settlements and Meyer's (2014) article provided empirical data on service provision in one province of South Africa. The main objective of the current paper is to review and identify potential barriers to provision of new residential infrastructure (housing and related facilities) with an aim of reducing or eradicating the alarming backlogs. The paper presents a discourse on the global and local housing and basic infrastructure situation, while identifying the barriers which have been cited as contributing to the status quo. The current paper adds to existing knowledge about the problem of housing and basic services delivery. In addition, it provides current evidence as regards housing and basic infrastructure provision which would be invaluable to housing policymakers in different tiers of government in identifying ways to improve housing and basic services delivery.

A distillation of literature from online journals, conference proceedings, government reports, and theses and dissertations is presented. The search was conducted using notable search engines including Ebscohost, Science Direct, Emerald, Academic Search Complete, Google and ASCE Library. Materials, spanning a 10-year period from 2006 to 2015, were included based on their relation to the subject, that is, containing keywords such as housing, residential development, infrastructure, barriers, social infrastructure, affordable housing, low-income housing, basic infrastructure and basic services. The succeeding sections present a discourse on the housing and basic infrastructure situation whilst identifying the hindrances to development.

## **2 HOUSING AND BASIC SERVICES DELIVERY**

## 2.1 Global Evidence

Adequate and affordable housing (AH) is a critical development imperative for most governments; yet, globally, housing provision has not kept pace with the needs of the growing population living in and migrating to cities (Tiwari and Hingorani, 2014). A number of international studies have found that AH shortage is ubiquitous and there is growing lobby for alternative mechanisms to be put in place to allay the problem.

In a review of India's policies and practices regarding housing affordability, Gopalan and Venkataraman (2015) reported that in addition to the strain on basic amenities such as water and power, there is an estimated housing shortage of 18.78 million houses with 99% in the economically weaker and lower income groups. The authors revealed challenges and critical issues in the affordable housing sector comprising availability of land, including marketable parcels (large tracts of centrally located urban land owned by public entities such as the railways, ports, and defence authorities and whose holdings are difficult to monitor, thus resulting in proliferation of slums and scatter settlements) as well as land ownership dynamics. Other identified issues were rising costs of land and construction, as well as regulatory constraints.

A case-study research in Australia reported that housing affordability was very low in the local government area in which it was conducted; with the average home seven times the average income of households (Emsley *et al.*, 2008). The authors viewed that the predominant form of affordable housing in Australia is affordable rental housing whereby dwelling units are built and managed by dedicated non-profit private companies (in support of the local government) and subsidized by the sale of the units to individuals eligible for public housing but unable to participate effectively in the open market. However, according to the authors, Australia is still ranked one of the lowest in housing affordability, internationally, because housing affordability encountered by lower income households is driven by demand issues as a result of growth in number of households, a rise in wealth, tax concessions to landlords and availability of finance; as well as supply factors arising from increasing costs of construction, land availability and planning and infrastructure changes.

That supply and demand factors moderate the provision of housing for lower income groups was supported in the recent study by Tiwari and Hingorani (2014). According to Tiwari and Hingorani (2014), housing supply factors such as availability of land, building regulations, productivity of the construction industry, direct and indirect involvement of government in house-building, existing housing stock; as well as demand-related factors such as household income, availability and terms of housing finance, are in turn moderated by the institutional framework in India. It was argued that attention to these demand and supply factors simultaneously could address problems of affordability.

A related study in India emphasized that provision of housing and supporting infrastructure such as water supply, sewerage, access roads and electricity, to rapidly increasing urban populations worldwide is one of the key challenges for respective governments, industry and international agencies (Syal *et al.*, 2006). Strong pressures are being placed on existing housing, land and supporting infrastructure as a result of the rapid urbanization. The authors further revealed that India's urban centres are characterized by shelter vulnerability (poor quality of housing and inadequate basic services). They concluded that the task of providing affordable housing in developing countries can be met by introducing more liberal finance options and subsidies for stakeholders in the homebuilding process, that is, real estate developers, contractors and potential home buyers (Syal *et al.*, 2006).

In a report on housing affordability, the Auckland Council in New Zealand revealed that there is widespread and persistent overcrowding due to rapid urbanization, and a rising

shortage of housing accessible for people on low and modest incomes in Auckland. The situation is expected to increase with increasing demand for housing, with a projected shortfall of 90,000 homes by 2020 and about 10,000 homes a year needed. A household economic survey revealed that 28% of households pay more than 30% of gross household income on housing costs and 51% of households who earn less than \$50,000 per year pay more than 30% of their income on housing, which is widely recognised as unaffordable (Auckland Council, 2012).

The situation in Nigeria seems to be the bleakest with a staggering population of over 140 million and still increasing at an annual growth rate estimated at 3.2% (Ayedun and Oluwatobi, 2011). Despite the notion of housing as a measure of social standing and prestige in the country, a view supported by Ugonabo and Emoh (2013), only 10% of those who desire ownership can actually afford it as opposed to 92% in Singapore, 78% in the UK, 72% in USA, 60% in China and 54% in Korea (Ayedun and Oluwatobi, 2011). The housing deficit which stands at approximately 17 million units, will require funding to the value of N42.5 trillion (Ayedun and Oluwatobi, 2011). This deficit has accumulated over the years due to a number of reasons including issues with the land tenure system (whereby all holdings to land are vested in the Governors of each state in the federation) which have been compounded by constraints related to political consent and government bureaucracy. Other constraints were identified as stagnated wages of civil service citizens, building legislations, inaccessible and inadequate financial support from government and financial institutions, low investment in housing, lack of priority given to housing by successive governments, among other things. This desktop study dwelt on sustainability of housing construction in terms of building materials and affordability by private developers who are mainly employees in the public sector. The authors concluded by reiterating that the *status quo* regarding affordable housing provision could be addressed if an enabling environment for private sector investment is provided via availing favourable mortgage instruments as well as political and legal frameworks.

In addition to the hindrances identified in Ayedun and Oluwatobi's study, a more recent case study conducted in an Eastern state in Nigeria reported that lack of critical infrastructure, affordability gap, inefficient development control, youths harassment of developers, inelegant revocation and compensation processes influence provision of affordable housing (Ugonabo and Emoh, 2013). The authors further revealed that housing estates were developed in mass by the housing corporations/parastatals in the state to cater for the needs of the low and medium income earners. The procedure involves provision of land by the state government to the corporation, issuing certificate of occupancy, handing over land, granting planning approval and providing necessary support to facilitate the execution of the housing project. The corporation then develops the estate either as fully or partly developed housing units or as site and services scheme and sells the plots of varying sizes to members of the public. The corporation grants leases from their term to the prospective purchasers who register same at the lands registry as bona fide lessees. However, a general lack of infrastructural facilities like good roads, drains, water and electricity was indicated as a characteristic of these government residential layouts, which have in turn compounded the problem of housing provision in the state. Thus, these housing estates are not fully functional or serviceable. Sadly, when the residential developments are fully serviced, they cost beyond the affordability level of the low income group (Ugonabo and Emoh, 2013).

The importance of functional infrastructural facilities which support habitation, such as water, electricity and roads, was echoed in Kihato (2012). The author viewed these infrastructural facilities as necessary for housing. Likewise, Tiwari and Hingorani (2014) concurred that housing provision incorporates basic services such as water and electricity. The study by Tiwari and Hingorani (*ibid.*), which was conducted in India, suggested that

basic infrastructure is necessary for development of livable cities. The authors went on to say that 30% of the world's urban population are either living in poor housing conditions in slums or are homeless. According to the authors, in 2010, 61% of the sub-Saharan population was dwelling in slums, 35% in South Asia, 28% in Eastern Asia, 31% in South Eastern Asia, and 24% in Latin America and the Caribbean. The development of these slums is perhaps as a result of the rapid urbanization which poses an on-going challenge to meet the infrastructure needs of citizens, and the most disadvantaged are the low income groups who have been driven into informal shelter in the burgeoning slums in cities.

According to Nsama (2007), the administration of land through the customary land tenure system is one of the reasons for under development of general infrastructure development in Zambia as well as in most African countries. In the author's view, this system of tenure whereby land is primarily administered by traditional leaders, is insecure and unfavourable to land ownership as no proper structures or guidelines exist to ensure effective administration.

Likewise, Boshoff *et al.* (2013) agreed that insecurity of land tenure as well as mismanagement and poor supervision of budgeted development funds were primary reasons for housing backlogs in the country in Botswana. This mixed methods study which assessed private and public sectors' contribution to housing development in the country proposed government efforts and policies to eradicate backlogs and improve quality of lives of citizens of all income groups. According to the authors, it will be necessary to develop 12,000 residential units in the next 10 years to meet the increasing demand for housing. To redress the problem particularly concerning the low-income groups, the government through its poverty alleviation and housing schemes, introduced the Self Help Housing Agency in 2001 by which funds were allocated directly to city councils through the poverty to disburse to applicants at subsidized rates; yet the problem persists (Boshoff *et al.*, *ibid.*).

According to the United Nations (UN) HABITAT, the inevitable outcome of Nigeria's population explosion is the aggravation of urban blight and squalor, resulting in the majority of urban dwellers living under sub-human conditions in slums and squatter settlements without employment and any visible legitimate means of livelihood" (Jiboye, 2011). Thus, the poor living condition of the urban slum dwellers in Nigeria is compounded by harmful pollution and precarious housing situation. Another factor which was blamed for this degradation was a lack of governance. According to the World Bank, good governance 'gives priority to the poor, sustains and creates needed opportunities for employment and other livelihood' (Jiboye, 2011). It should be effective (in terms of efficiency, subsidiary and strategic vision), accountable (relating to transparency, rule of law and responsiveness), participation (citizenship, consensus orientation and civic engagement), and secure (which addresses conflict resolution, human security and environmental safety (Jiboye, *ibid.*).

A similar study in Nigeria emphasized that the unabated growth of the population, negligence by government and incapacity of government impede planning and delivery of low-income housing in Lagos (Opoko and Oluwatayo, 2014). There is an overwhelming need for affordable housing provision which undoubtedly requires a pool of innovative ideas to tackle the problem. The situation exists globally as evidenced by the above-discussed literature.

## **2.2 Realities at the Local Level**

According to Meyer (2014), the Department of Human Settlements is responsible for provision of accommodation and basic services. However, a recent quantitative study on

housing and basic services delivery indicated that housing, water, electricity and sewerage are the most lacking components in the sampled area. According to the author, a total housing backlog of 2.1 million units exists, affecting approximately 12.5 million people (Meyer, 2014). The level of provision of some basic services to households in South Africa is presented in Table 1. The table suggests that provision of basic services to support habitation still requires attention. The authors opined that basic services are essential and indispensable stating that inclusion of basic services should be part of the development plan for housing delivery for the poor citizenry. They further stressed that provision of housing and basic services for the poor through subsidies is necessary and impacts on poverty reduction in the country, since jobs are created through construction and maintenance of these facilities provides opportunities of entrepreneurship and creation of wealth. This study focused on the level of provision of services (including housing and supporting infrastructure) in poor communities (including households with an average monthly household income of R1,458) in one province of South Africa.

Table 1: Basic services provision in South Africa

Service	Percentage of households
Piped water	73.4
Electricity	84.7
Sewer systems	57.0

Adapted from Meyer (2014)

Gumbo (2014) revealed that housing delivery for the low income communities is stagnated due to the slow and complicated processes involved in provision of land and land services, ranging from planning, basic services provision, construction of housing and occupation. The author advocated a sustainable change in the process, to that from planning to occupation on an informal basis, construction of formal housing and then provision of basic services, a view which is not supported by the authors in Tiwari and Hingorani (2014) (cited earlier), which expressed that allowing informal occupation results in burgeoning of slums which are difficult to eradicate once they are in existence. Nonetheless, Gumbo (2014) argues that unserviced plots of land which are planned or delineated ahead of formal building and servicing can alleviate homelessness in the short term and improve affordability of such plots, even after basic services have been provided. Thellane (2008) supported that land availability is particularly complex in South Africa due to the cumbersome policy and legislations which curtail access to land for affordable housing. Other related factors identified are local human resource capabilities (lack of skills in municipalities to implement the steps outlined by the legislative framework), administrative matters across the spheres of government, particularly within the municipalities, planning challenges regarding zoning, the interplay between the regulated and non-regulated markets, and so forth. This qualitative study identified the need to address the challenges of regulatory and planning frameworks and the political and institutional arrangements which affect urban land availability and recommended investigation of policies such as the Breaking New Ground (BNG) policy of the Department of Housing's performance in delivery of affordable housing.

A recent mixed-method study on financing water infrastructure indicated that project cost and funding sources influence delivery of infrastructure (Ruiters, 2013). The study also revealed existing water infrastructure models including the National Revenue Fund (NRF) (on budget), conditional grants, balance sheet funding (tariff model). The author advocated that alternative use of PPPs, financial markets (off-budget), special banks or financial institutions, private sector markets (build-own-operate-transfer) and demand (market) risk funding, to aid in the augmentation of public sector funds for services

infrastructure provision. These models were evaluated based on efficiency, effectiveness, equity, appropriateness and sustainability. This study however focused on financing water infrastructure.

### 3 LESSONS LEARNT

There are significant needs for social infrastructure provision in terms of housing and basic services including water, access roads, drainage and household power supply, worldwide. The reality in South Africa is no different, as the above-discussed literature suggests. This is primarily due to rapid urbanization which invariably results in the burgeoning of slums characterized by shelter camps and informal settlements. The level of provision and maintenance of housing infrastructure is unsatisfactory. It is therefore pertinent to given continuous attention to this subject to decipher innovative ways of assuaging the problem.

A panoply of factors was also identified as barriers to delivery of housing and basic essential services to support habitation. These factors include capacity/competence, stakeholder management dynamics, finance/funding availability (approvals and investment), corruption, land availability and accessibility, accountability and transparency on the part of governments, administrative and legislative asymmetries.

### 4 CONCLUSION

The study sought to identify the status quo regarding provision of residential infrastructure with respect to housing and related/support facilities. By identifying the hindrances to development of such infrastructural facilities, possible strategies to eradicate the problem were also highlighted. Good, straightforward and transparent governance; encouraging private sector investment as well as astute management of housing development participants could be indispensable in improving housing and basic infrastructure delivery.

The current article has a major limitation, being a review paper. Further research could be conducted to investigate the extent to which the above-identified factors relate to and/or influence the status quo with regard to residential developments in various geographical areas. More empirical research could also be conducted to establish perceptions of housing development professionals/participants on the effect of various strategies aimed at improving and eradicating housing and basic services delivery backlogs.

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