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Financing Infrastructure for Housing Developments: Case Studies from Sub-Saharan Africa



Executive Summary

This case study report provides examples of how infrastructure for housing projects is financed across sub-Saharan Africa. It describes and discusses alternative infrastructure financing mechanisms, their advantages and disadvantages, and the preconditions to their application in different contexts. It relies primarily on work done by the African Centre of Cities, funded by UK Aid.

Infrastructure provision is an essential part of housing development. Housing can only satisfy basic needs if it is accompanied by the provision of basic services through infrastructure. The infrastructure deficits in African cities are well documented and result in vast areas of cities without access to services and constraints on further development. Over 200 million people, 62% of Sub-Saharan Africa's urban population, live in slums and high urbanisation rates result in the continuing growth of poorly serviced areas. While African countries are making progress with infrastructure provision, this is insufficient to make sufficient headway in reducing backlogs in access to urban infrastructure and associated services. One of the major problems with the provision of infrastructure is the financing thereof.

In order to finance infrastructure, there needs to be an understanding of what types of infrastructure there are, as the financing arrangements for the different types of infrastructure differs. Broadly, infrastructure can be divided into 'social' and 'engineered' infrastructure. Social infrastructure consists of schools and other education facilities, health facilities, libraries, sports and recreation facilities, parks and squares and buildings for security and emergency services. Within engineered infrastructure there are three different subdivisions: bulk, connector and internal infrastructure. Bulk

Across Africa, practitioners are grappling with the challenge of creating an enabled housing finance environment. While these challenges may seem insurmountable, there is a growing track record of novel solutions and initiatives, pioneered by policy makers, financiers, developers and households themselves, suggesting that there are new opportunities for making the housing finance sector work for the poor in Africa. This case study is part of a broader series that CAHF has commissioned in order to support professional development and inform a broader research and dialogue process. The case studies vary, addressing themes as diverse as housing microfinance, mortgage liquidity facilities, cement block-banking, home loan guarantees for the informally employed, and infrastructure financing, highlighting experiences from countries across the continent. We hope this series contributes to more precise and successful endeavours that realise the opportunities in this market.

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The Centre for Affordable Housing Finance in Africa (CAHF) is a not-for-profit company with a vision for an enabled affordable housing finance system in countries throughout Africa, where governments, business, and advocates work together to provide a wide range of housing options accessible to all. CAHF's mission is to make Africa's housing finance markets work, with special attention on access to housing finance for the poor. We pursue this mission through the dissemination of research and market intelligence, supporting cross-sector collaborations and a market-based approach. The overall goal of our work is to see an increase of investment in affordable housing and housing finance throughout Africa: more players and better products, with a specific focus on the poor.

and connector infrastructure includes water supply infrastructure from resource to distribution network in a town, wastewater treatment works and outfalls, electricity generation and transmission infrastructure, solid waste disposal infrastructure as well as larger scale road and public transport infrastructure. Internal infrastructure is that within a property development or suburb: the streets, pipes, sewers, on-site sanitation and low voltage powerlines.

Infrastructure finance

The conventional approach to funding middle to high income residential property development and associated infrastructure is that the developer provides and funds the building, land and internal infrastructure (effectively everything within the boundary of the area being developed)¹. The city, possibly with the assistance of national government and parastatals, provides and funds the bulk, connector, social and community infrastructure. Due to the survivalist nature of many cities in sub-Saharan Africa, neither city nor state has the financial capabilities to pay for this infrastructure, and it is therefore either not provided, or provided in a sub-standard manner. The 'conventional' approach therefore has its limitations.

There are alternative methods of financing infrastructure associated with middle to high income residential property developments. To investigate these, 11 'mini' case studies² of residential property developments in sub-Saharan Africa were undertaken in order to establish which financing techniques are used as part of the property development process. The property developments showed a range of different financing arrangements. They are categorised into one of four different groups.

Conventional model

Despite the infrastructure funding limitations of the public sector in sub-Saharan Africa, the conventional model of infrastructure provision is widely applied. The reasons for this may be historical (the way it has always been), but in many cases the motivation seems to stem from the notion that the government can stimulate the middle to high income housing sector through the provision of bulk and connector infrastructure. This may even be taken a step further where developers are given access to subsidised land in addition to bulk and connector services, evident in number of the case study projects. Examples of the conventional model, or a slightly modified version thereof are found in Cameroon, Angola, Benin and Rwanda. The conventional approach for middle to high income developments needs to be seen in relation to that for low income housing where private property developers are not active and where the shortage of finance for infrastructure is even greater. This leads to questions as to where state and city financial resources should be best directed in order to balance social and economic objectives.

'In-kind' contributions

The 'In kind' contribution approach is where the developer provides connector and bulk infrastructure themselves. In many cases this is because of the incapacity of the public sector to provide this infrastructure, leaving the developer with little choice. However, there may be other reasons for local government to require contributions in kind, including the expediency of using the contractor already on site and the avoidance of cumbersome procurement processes and bureaucracy involved in government infrastructure provision (in South Africa, for example). Therefore, 'in kind' contributions, if well managed, can be an appropriate and effective land-based financing mechanism. Examples of 'in-kind' contributions are found in Nigeria, Kenya, Rwanda and Zimbabwe.

Lease

The case of Ethiopia illustrates that land leasing is a viable means of infrastructure financing through land-based financing. However, the revenue raised from the leases contributes only 20% of infrastructure cost with the remainder coming from national transfers in the form of a tax sharing arrangement. This instrument is not widely applicable because in most countries land is not owned and controlled by national government. However, in addition to Ethiopia there is evidence that it is being applied in Cameroon but this is under-researched.

Development charges

The term 'development charge' is used here for an up-front payment by the developer to cover the cost of bulk, connector – and sometimes social – infrastructure. The charge is calculated through a formula which aims to approximate the actual cost of the infrastructure. If correctly applied in terms of a policy and formula they have the potential to be equitable and transparent, as has been illustrated by widespread application internationally. While development charges have been applied with some success in South Africa, the case studies in Kenya and Zimbabwe indicate a more widely occurring situation where they are applied rather arbitrarily without a clear policy and often without ring-fencing of the funding for urban infrastructure. Often the charge is essentially a once-off tax as it is not related to the cost of infrastructure and neither are the funds raised used for infrastructure to serve the property developments to which the charge is related.

Preconditions for application of land-based financing

Land-based financing has the merit that it draws private finance into the funding of urban infrastructure, in contrast to the conventional approach. It also provides for a greater role of the private sector in building this infrastructure. Nevertheless, for land-based financing to be effective it does require a capable city backed by a capable state. There needs to be a sound plan for infrastructure in the city, appropriate engineering standards, sound land use management procedures and the ability to engage

¹ In the case of low-income housing, the developer is often the city or state, in which case the internal infrastructure is provided with public funding as well.

² The term 'mini' is applied here as they case studies were undertaken with a small budget and provision for only 3 days of research time for each.

with developers to set up agreements regarding the scope, standards and timing of the infrastructure provision and any payment requirements. These requirements vary based on the type of land-based financing required, with the emphasis on technical factors in the case of ‘in kind’ contributions – as the developer is building infrastructure which needs to be integrated into city-wide infrastructure systems - and financing arrangements in the case of land leasing and development charges.

Conclusion

The financing of infrastructure that serves housing developments is determined by arrangements well beyond the immediate scope of any particular housing project. In the case of finance, the arrangements relate to the health of the national fiscus as a determinant of the ability to use national transfers, to the balance sheet of local government as a determinant of the ability to borrow on the capital market and to the policies applied to use public funds to serve private sector property developments. The fundamental choice that a local government³ makes is whether to follow the conventional approach of providing bulk connector and social infrastructure to facilitate development, or whether to use the development process to raise the required capital (or parts of it) through land-based financing. This choice is often about whether to use scarce public funds to provide infrastructure for poor households and hence meet social objectives or to use them for middle to high income residential and commercial property development with the argument that this stimulates the local economy and housing market. With regard to the market for middle to high income housing, the argument from developers and home buyers will consistently be for the conventional model as this avoids the inclusion of bulk and connector costs into the selling price of properties. However, with limited funding available and the importance of diverting this towards infrastructure for poor households, this price may have to be paid.

The African Centre for Cities study, under which these case studies fall, found that land-based financing is being applied in many cities in sub-Saharan Africa. However, it is seldom being applied properly and requires far greater attention than it has been getting to date. It has many advantages over the conventional approach but also requires capacity on the part of local and national government to set sound policy, plan for infrastructure and manage the relationship with developers. A specific recommendation of the study is to gain greater support for development charges as the intervention with the highest potential for relatively immediate, positive impact.

1. Introduction

This report provides case study examples of how infrastructure for housing projects is financed across sub-Saharan Africa to describe and discuss alternative infrastructure financing mechanisms, their advantages and disadvantages, and the preconditions to their application in different contexts. The report draws on work funded by the UK Department for International Development on Urban infrastructure in sub-Saharan Africa – harnessing land values, housing and transport, with additional supplementary research and analysis undertaken for this project.

The report begins by presenting 11 case studies of housing developments in sub-Saharan Africa in Section 2, focussing on who was responsible for financing which components of the infrastructure supporting the development. Section 3 defines the components on infrastructure and their relevance for housing projects before describing the financing mechanisms available. This sets up the analytical framework for evaluating the case studies in Section 4. The analysis of the various models of infrastructure financing is presented in Section 5 before conclusions are drawn.

2. Property Development Case Studies

Overview

This section will present an overview and an explanation of the infrastructure delivery process associated with the 11 different developments in Sub-Saharan Africa, listed in Table 1.

Table 1: List of case studies⁴

Country – City	Project name	Project type	Geographic region in SSA
Angola – Luanda	Kilamba	Mixed use but primarily housing project	Southern Africa
Benin – Cotonou	Arcon Ville	Housing – intended for low to middle income but not affordable to low income households	West Africa
Cameroon – Douala	Sawa Beach	Mixed use – mainly housing mid-high income	West Africa
Cote d’Ivoire – Abidjan	L’opération les floraisons	Housing – some commercial	West Africa
Ethiopia – Addis Ababa	Lideta	Mixed use, primarily residential	East Africa

³ This decision is made at the local government level if local government has the responsibility for infrastructure provision and the land development approval process. If, however, the mandate for infrastructure provision lies with national government or a parastatal, then it is possible that the decision lies outside of local government. But local government will almost always be a player in the urban land development process.

⁴ More detail on each case study is provided in the Appendix.

Table 1: List of case studies continued⁴

Country – City	Project name	Project type	Geographic region in SSA
Kenya – Nairobi	Two Rivers	Mixed use – commercial & high income residential	East Africa
Nigeria – Lagos	Carlton Gate Estate	Mixed use – mainly housing middle – high income	West Africa
Rwanda – Kigali	Gacuriro Estate Phase I	Housing – Middle to high income	Central Africa
Rwanda – Kigali	Gaposhu Estate Phases I & II	Housing – Middle to high income	Central Africa
South Africa – Cape Town	Riverstone Villas	Housing – Middle to high income	Southern Africa
Zimbabwe – Harare	Budiriro Housing Development	Housing meant to be low income but more middle income	Southern Africa

The developments chosen represent a geographic spread of property developments in Sub-Saharan Africa, yet are not necessarily representative of what is happening on the sub-continent.

Angola – Luanda: Kilamba

Kilamba is a mixed-use public housing development financed by a USD 3.5 billion Chinese credit line granted to the Angolan government. In 2014, Kilamba housed 53 000 residents in 24 multi-storey blocks and the local administration of Kilamba as well as 14 schools, shops, restaurants and a health centre. There are plans to construct an additional 60 000 apartments and 3 300 freestanding plots in two subsequent phases.

Figure 1: Apartment blocks in Kilamba with signs indicating “strengthening Sino-Angolan friendship” in Portuguese and Mandarin and “CITIC Construction” (Picture taken by Sylvia Croese)



Land in Kilamba was provided at no cost to the developers. The construction of Kilamba was initially to be financed through an oil-backed loan from a private agency called the China International Fund. However, the loan is now being repaid to the Chinese government with the state oil company Sonangol functioning as an intermediary and guarantor on behalf of the Angolan state. The installation of the bulk and connector infrastructure in Kilamba was part of the state funding package for the project as a whole. This bulk and connector infrastructure included a water treatment plant, a sewage treatment plant, electricity transformers, roads and stormwater infrastructure. Housing on the site was ultimately sold at subsidised rates to consumers, with the subsidies being carried by the State. Interestingly, as part of the construction company, the Chinese contractor is responsible for the ongoing maintenance of the infrastructure in Kilamba.

The project was part of the state mass housing programme to overcome the housing deficit in the capital. Apartments in Kilamba were initially put on sale by the state at market prices, presumably in an effort to get a return on investment. However, due to the absence of affordable mortgage finance in Angola very few people bought houses after Kilamba's inauguration in 2011. To remedy the situation, the government lowered the prices and proposed a state subsidized rent-to-buy scheme to be paid off over a period of 15 to 20 years.

Benin – Cotonou: Arcon Ville

Arcon Ville is an area 15km from Cotonou airport in the Abomey Calavi local council. The development involves the construction of 5 000 housing units as part of a government programme to build 10 000 low cost houses, focused specifically at benefiting low and middle income earners. Due to a shortage of adequate housing across all markets, Arcon Ville has shifted from a low to middle income development to more of a middle income development. Arcon Ville is a subsidised housing development using a public private partnership to provide the required infrastructure and housing top structures. The institutions involved in the development are the private developers (Arcon Ville), commercial banks and the Benin Housing Bank.

Figure 2: A completed unit at Arcon Ville (Picture taken by Bernard Tayoh)



Access to land for Arcon Ville was facilitated by the national government of Benin while the local council provided road infrastructure to and within the site. The local council also provided bulk sewerage, water, electricity, telecommunications infrastructure and a public health facility.

Initial financing of approximately USD 52.2 million was put in place for a pilot phase of 2,100 housing units by the government (via a Treasury bond) and involving direct contributions of two banks: the Benin Housing Bank (BHB) and the Atlantique Bank, a commercial bank. The private finance was to be repaid partly through sale of the units, but also through mortgages provided to the home buyers from the participating banks. However, the state input through the Treasury bond represents a subsidy to reduce the price of all housing types in Arcon Ville, estimated at 25 – 30% of the price of the units. This subsidy covered the costs associated with the land, bulk and internal services which were provided by the state.

These subsidies are justified on the grounds of widening and strengthening the tax-revenue base of the local councils, both directly from the development, but also through increased land tax revenue from peripheral land due to increased land values as a result of the development. Immediately following the demarcation of the land for Arcon Ville, public utility companies proceeded to extend their networks to cover the new zone in anticipation of future demand.

While Arcon Ville is regarded as the most successful housing project in Benin, it has been marred by an array of challenges, including the local councils not providing adequate public infrastructure and not setting aside adequate funds for the project.

Cameroon – Douala: Sawa Beach

Sawa Beach is a 1 000 hectare development with the objective of providing adequate housing to the rising population in Douala, as well as additional space for commercial activities. It is estimated that this development will have 10 000 housing units targeted at middle to higher income households.

The development has been financed through a complex public private partnership arrangement involving the Douala City Council, the state of Cameroon and a foreign private investment firm (of which Douala City Council is a shareholder) and is based on a 'build, operate and transfer' (BOT) arrangement.

Land for the project was originally owned by the State, and a temporary transfer to the local City Council was arranged under a long-term lease agreement. This lease appears to have been transferred on to the developer or the ultimate occupants, because after 25 years the ownership of the houses will return to the City Council.

The City Council is providing all road infrastructure, inside and outside the site, as well as the water treatment and sewerage treatment plants which serve the site. It is assumed that the electricity is being provided to the site at no cost to the developer. The roads were funded through an international loan taken out by the city, but with a state guarantee. The City Council's capital contribution to the infrastructure for the development represents 30% of the total development cost, with the remainder being funded by the private developer. The future revenues from the development over 25 years (presumably a combination of the property taxes, tariffs and rentals) will be shared by the private developer (75%) and the City council and the state (25%).

Cote d'Ivoire – Abidjan: L'opération les floraisons

L'opération les floraisons is a private development which consists of 3 000 social (low to middle income) housing units on a total area of 90 hectares over three separate but adjacent sites. The development will also contain a medical centre, commercial centre and education centre.

Land was acquired through a mix of State land provided to the developer for mass housing and the purchase of land by the developer from traditional land owners (although the purchase was exempt from government taxes). The State also facilitated finance to the developers from financing institutions at a preferential rate. The provision of public infrastructure occurs mainly through the state Ministry of Construction, Housing, Urban Affairs and Sanitation, who has designed and constructed bulk road, electricity, water and sewerage infrastructure. Secondary (connector) and tertiary (internal) roads within the housing complexes are constructed by the developer.

Ethiopia – Addis Ababa: Lideta

The Lideta redevelopment is a 26 hectare area, strategically located in Addis Ababa between two large commercial areas. The site, which was previously occupied largely by unserviced informal dwellings, now contains nine hectares of State housing (low and middle income households) and five hectares of privately held land for commercial or residential activity. The remainder of the land is for roads, other infrastructure, green areas and social services.

The State ownership of land in Ethiopia means that there was no problem accessing land for a City-run development like Lideta. Extensive consultation was held with existing residents, resulting in expropriation fees being paid to the residents. All bulk and connector infrastructure in the area was constructed by the City, State or Parastatal, depending on the service. However, it was financed by the revenue generated from the lease of commercial and high income residential land, which is auctioned to the highest bidder. This lease revenue also cross-subsidised the construction of low (and medium) income housing. The first 10% of the lease value collected up front was used to pay for the infrastructure on the site (roads, stormwater, electricity, broadband internet, parks, while the remaining 90% covers ongoing service provision, maintenance and renewal.

Figure 3: Lideta Redevelopment site



Kenya – Nairobi: Two Rivers

The Two Rivers Development is a mixed use development planned on a 100 acre site between two rivers in Nairobi. It will include 100 to 150 middle and high income apartments, a retail/office block, a stand-alone office block and two high-end diplomatic hotels. All of the internal infrastructure is provided by the developer. Bulk and connector infrastructure provided by the developer includes:

- Roads: An underpass and road interchange on a major arterial road.
- Water supply: To compensate for poor water supply from the City, the developer is providing an independent water supply system consisting of eight boreholes and, at a later stage, a water treatment plant.
- Sanitation: a wastewater treatment plant is provided with the hope that a connection to the City's sewer network will be possible in the future.
- Electricity: Initially the development's own generators are used. Ultimately development will receive power from national utility and would then only require its own transformer station.

Figure 4: Artist's impression of Two Rivers complex



Nigeria – Lagos: Carlton Gate Estate

Carlton Gate Estate is one of numerous new gated estates in Nigeria. It is 28.3 hectares, and is a private joint venture development between a developer and a local chieftaincy. It consists of 231 fully serviced plots and contains walkways, green areas and recreational areas. There are also plans to construct schools, banks and other commercial areas.

The land was provided by the chieftaincy to the developer, who contributed all of the financing. The developer provided the majority of the bulk and connector infrastructure to the site, including transformers, street lights, internal roads, drains and walkways, telecommunication lines, a bore-hole with water treatment plant and internal gardens and other green amenities. One external bulk road was provided by a private company through a State tolling concession (thus a PPP), which was later bought back by the State. Other public transport infrastructure is provided by the State.

Figure 5: Typical housing typology with a typical access road within Carlton Gate Estate.



Rwanda – Kigali: Gacuriro Estate Phase I

Gacuriro Estate is a middle to high income residential development consisting of approximately 100 units spread out over 21.8 hectares. The developer is the Rwanda Social Security Board, which is a parastatal entity.

The land was expropriated by the national government, through the local government, from existing private land owners at a rate below the market value and subsequently given to the parastatal developer at no charge. The parastatal developer funded the bulk and connector infrastructure, with the cost being recouped through the sale of the houses to individual home buyers. There were spill-over benefits from the infrastructure development, stimulating further government investment in bulk road infrastructure to improve access between the development and the city centre. While this has unlocked further development in the area, the increased land value has not been captured as the state does not appear to charge value-based property taxes.

Rwanda – Kigali: Gaposho Estate Phases I & II

Gaposho Estate is a development of middle to high income residential properties intended for re-housing genocide victims. It is being developed by a government agency acting as an umbrella developer, which has contractual arrangements with various private subsidiary developers.

Land was expropriated by the main developer and provided at no cost to the subsidiary developers. All connector and bulk infrastructure was provided to the development by the State/City at no cost. The developer paid for all internal infrastructure, which is recouped from the house sales to the ultimate owners.

South Africa – Cape Town: Riverstone Villas Housing Development

At Riverstone Villas, situated in the outlying suburb of Kraaifontein in Cape Town, a private developer is converting 1.17 hectares of undeveloped land into 51 semi-detached units on individual erven of around 200m². It is the largest residential development approved using the new development charges policy and calculator introduced by the City of Cape Town in 2014. According to the policy, the development charge is a calculation of the difference between the impact on bulk services between the previous and future land uses, which is then multiplied by standard unit costs for each service. The policy covers roads, transport, stormwater, sewerage, water and solid waste. Social infrastructure, electricity, and services provided by other spheres of government are excluded from this policy. Developers are charged under a separate, but similar policy for electricity, while social infrastructure is funded through property rates revenue and national transfers.

The unit costs were derived from a comprehensive engineering modelling exercise that projected future growth and the resultant demand and cost of infrastructure to service this demand. The unit costs are city-wide averages and are applied universally to all developments.

While the policy allows for the developer to offset the development charge against bulk and connector infrastructure that the developer constructs himself, in this case the developer paid the development charge as a single payment prior to development approval being granted by the City. This charge would cover both the cost of historic investments in surplus capacity that the development could utilise, as well as dedicated infrastructure required to serve the development. The breakdown of the calculated demand (impact) of the development on each service, as well as the resulting development charge, is shown in Table 2. The total development charge works out to an average cost of USD 1 771 per residential unit for bulk infrastructure.

Table 2: Table of development impact and calculated development charge for Riverstone Villas
(Source: City of Cape Town)

Service	Units	Additional demand	Contribution (USD)
Roads	Trips/day	139	USD 49 228
Transport	Person trips/peak period	58.3	USD 2 923
Stormwater	Ha°C	0.7	USD 6 926
Sewerage	kl/day	19.9	USD 20 034
Water	kl/day	24.5	USD 3 025
Solid waste	kg/day	329	USD 8 196
Total bulk engineering services component of Development Charges payable			USD 90 333

Zimbabwe – Harare: Budiriro Housing Development

Budiriro is a 3 102 unit housing development. It was originally intended as a low income residential development, but the entry requirements for residents (e.g. deposit required) dictate that it will likely be a medium income development. The developer is a joint venture between the City and a private developer, the Central African Building Society.

Land was provided to the developer below market price. The developer then provided the infrastructure and developed the houses. The developer was tasked with providing on- and off-site infrastructure. The off-site infrastructure included seven schools, the servicing of commercial stands, service industry stands as well as church stands. The private developer also had to provide the water storage and distribution infrastructure, sewer infrastructure and the electricity connector infrastructure. The on-site infrastructure included the building of culverts and the provision and servicing of internal roads. The off-site infrastructure provided by the developer will also benefit the housing cooperative developing housing in the surrounding suburbs.

In addition to the provision of bulk, connector and internal infrastructure, an endowment fee of 10% of the total value of the houses is required to be paid by the developer to the city council before registration and transfer of the houses.

Figure 6: Plan and show house for the Budiriro Housing Development



Issues for Consideration

The above case studies present a wide variety of infrastructure provision and financing arrangements. When categorising the different types of infrastructure provision and financing arrangements, the following questions should be asked of each case study:

- What are the main categories of funding?
- What are the preconditions for each?
- What are the advantages and disadvantages of each?

The remainder of this report attempts to answer these questions, and place the case studies within a conceptual framework developed by the African Centre for Cities (2015) which categorises and describes land-based financing techniques in sub-Saharan Africa.

3. Infrastructure Provision for Housing Development

Background

Infrastructure provision is an essential part of housing development. Housing can only satisfy basic needs if it is accompanied by the provision of basic services through infrastructure. The infrastructure deficits in African cities are well documented and result in vast areas of cities without access to services and constraints on further development. Over 200 million people, 62% of Sub-Saharan Africa's urban population, live in slums and high urbanisation rates result in the continuing growth of poorly serviced areas (UN-Habitat, 2014; Racelma, 2012). While African countries are making progress with infrastructure provision, this progress is insufficient to make sufficient headway in reducing backlogs in access to urban infrastructure and associated services. In the case of adequate electrification, for example, between 2005 and 2008, urban electrification decreased by about 1%, to 57% of people with adequate access, yet the absolute number increased by almost 10 million over the same time period (IEA, 2014). In the case of water and sanitation, adequate access in urban areas of Sub-Saharan Africa was only 69% and 34% respectively (Jacobsen, Webster & Vairavamorthy, 2012). Of equal concern is the limited access to public infrastructure such as public transport systems, parks and community facilities that are central contributors to the quality of life in cities, as well as to their economic efficiency.

Defining Infrastructure

For the purpose of this case study, infrastructure is defined in two categories: engineered infrastructure and social infrastructure. Engineered infrastructure provides engineering services (water, sanitation, electricity, transport and solid waste) at multiple scales, while social infrastructure (schools, health facilities etc.) provides social services to individuals. In order to understand how infrastructure is financed as part of the development process, it is necessary first to describe the components of engineered and social infrastructure, as presented in Table 3: below, because the finance mechanisms for each may vary.

Table 3: Components of engineered and social infrastructure

Service	Component	Description
Engineered infrastructure	Bulk infrastructure	<p>Bulk infrastructure is large scale infrastructure serving cities and towns as a whole. It includes:</p> <ul style="list-style-type: none"> ■ The water supply infrastructure taking water from the resource, treating it and delivering it through pipelines and pumping stations to distribution reservoirs within cities and towns. ■ Wastewater infrastructure including outfall sewers transferring wastewater (sewage) from the city or town, treating it and returning the treated effluent to the river or other water body. ■ Electricity infrastructure to transmit and transform electricity from the national grid to sub-stations within cities and towns. ■ Distribution roads and public transport networks including the main arterial roads within a city linking nodes and linking to the periphery of the city. Typically they are dual carriageway or larger roads. ■ Solid waste landfills and recycling or alternative disposal facilities.
	Connector infrastructure	The connector infrastructure is the infrastructure linking the bulk infrastructure to the individual suburb or property development. It includes water distribution reservoirs and connector pipelines; collector sewers; medium voltage powerlines and transformers; and collector roads (linking suburbs to the distributor road network).
	Internal infrastructure	Pipelines, sewers, access roads and low voltage powerlines running within suburbs and property developments, including the connections to plots with meters and 'on site' sanitation systems.
Social infrastructure	Social and community infrastructure	Schools and other education facilities; health facilities; libraries; sports and recreation facilities; parks and squares; and buildings for security and emergency services. 19.9

How does infrastructure fit into housing project costs?

Although different housing projects in different locations may receive different levels of service, it is possible to define a typical housing 'package', including all infrastructure that enables the project to be integrated into a fully functional urban area. This package comprises:

- The building, sometimes referred to as 'top structure' or dwelling unit.
- Land including the cost of purchase, sub-division and registration.
- Internal infrastructure.
- Bulk and connector infrastructure.
- Social and community infrastructure.

The distinction of these components of the housing package is necessary because the responsibility and mechanism for financing each of these different components can, and often does, differ.

Who provides and finances the property development and associated infrastructure?

The conventional approach to funding property development is that the developer provides and funds the building, land and internal infrastructure (effectively everything within the boundary of the area being developed). The city, possibly with the assistance of national government and parastatals, provides and funds the bulk, connector, social and community infrastructure. In the case of low-income housing, the developer is often the city or state, in which case the internal infrastructure is provided with public funding as well. The rationale for this conventional approach is that bulk, connector and social infrastructure are public goods, resulting in positive externalities through its provision. In addition, it is important that this infrastructure is planned on a city-wide basis to function efficiently as complete, integrated and inter-dependent systems. The result of this conventional approach is that the city establishes the platform upon which developers build residential, commercial and industrial property. Cities will recoup this investment through revenues generated through rates and tariffs over time.

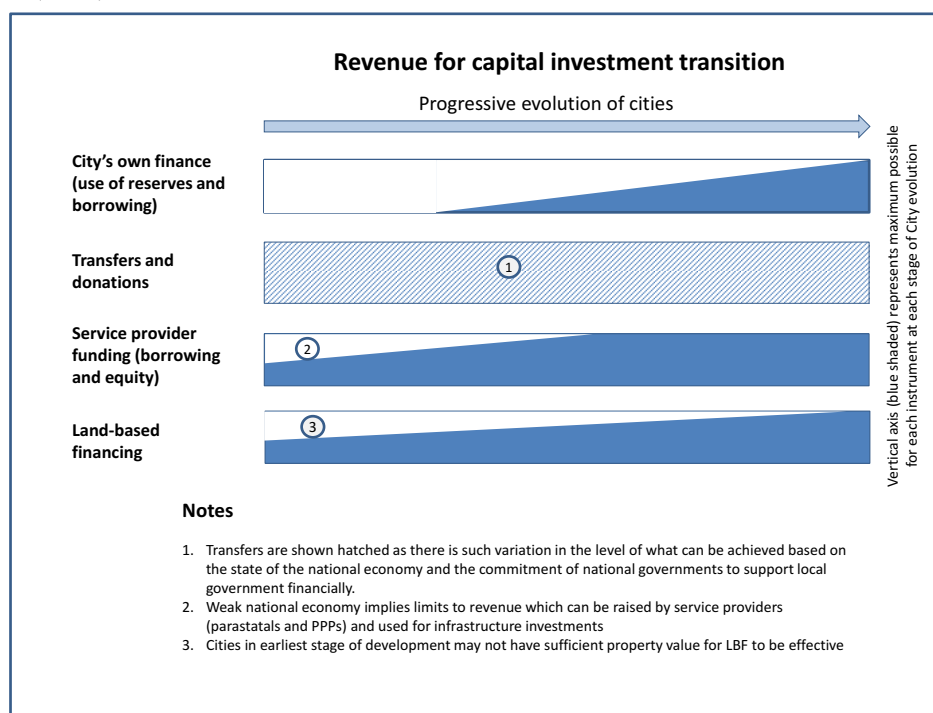
Sources of infrastructure finance

The conventional approach is only effective if the city and its partners can raise sufficient capital to fund the bulk, connector, social and community infrastructure and ensure sufficient future revenue to recover this cost. The reality is that in the majority, if not all, cities in Africa this does not happen: cities and parastatals cannot raise sufficient capital, either from reserves or through borrowing, even with the assistance of national government. Therefore, infrastructure is not provided where and when it is required. This stalls the property development process for middle to high income residential property and, of greater concern, means poor households do not get access to infrastructure and the associated services they need to survive.

The figure below, drawn from ACC (2015), illustrates the four main sources of infrastructure finance and relates these sources to their applicability in cities in various stages of evolution: from 'survivalist' cities with serious financial constraints on the left hand of the horizontal axis, to 'mature' cities with surplus revenue for investment on the right hand side. Each of these sources is discussed in more detail below (ACC, 2015).

Figure 7: Transition for main revenue-raising options for infrastructure investment

Source: ACC (2015:12)



City's own finance (reserves and borrowing): Survival-stage cities cannot provide adequate capital funding although the situation improves progressively as a city evolves and more reliable and consistent future revenue streams are created. Cities have greater capacity to borrow for services for which consumers pay directly (e.g. water and electricity).

Transfers and donations: Transfers include tax sharing, general-purpose grants and specific purpose grants. Also included in this category are donations (sometimes called grant funding) provided by international development agencies and other donors.

Service provider funding (borrowing and equity): Service providers external to the city, such as a parastatal (utility) public-private partnerships (PPPs), are appointed by the city or mandated by national government to provide services, including the provision of capital funding, in return for capturing future revenue, or future national grant funding. In sub-Saharan Africa, few PPPs provide urban infrastructure (Paulais, 2012), although the provision of services by parastatals is common (ACC, 2015). In most countries, national parastatals provide electricity with little or no private sector participation (Eberhard et al., 2008; Foster, 2008). Parastatals also provide water and wastewater services, with parastatals owned by local authorities being the most common (Banerjee et al., 2008).

Land-based financing: Land-based financing is a means for transferring the obligation for funding – and possibly provision – of bulk and connector infrastructure from the city to the developer and property owners. It is a broad term that encompasses a range of instruments that can be used to cover different components of infrastructure. The important point to note from the shape of the graph in Figure 7 is that land-based financing can function even for cities in 'survival' mode, because in some of these 'survival' cities, pockets of very high-value land are found, mainly because they fall within areas that are both well located and have some access to infrastructure.

Framework for understanding the mix of public and private infrastructure funding through land-based financing

Land-based financing becomes an important funding option when considering the limited extent to which transfers, city own-source revenues and service provider funding are able to cover the infrastructure investments required for cities in sub-Saharan Africa to function effectively.

Figure 8: Components of property developments and the land-based financing spectrum

Source: ACC (2015:12)

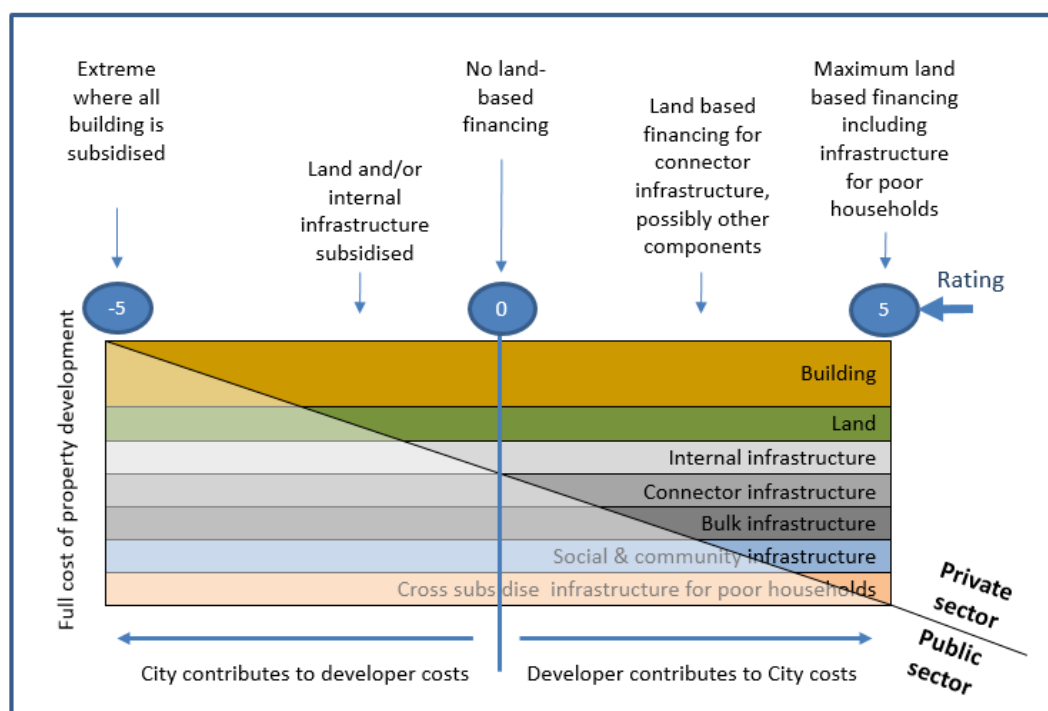


Figure 8 indicates the concept of a shared responsibility for financing the full cost of a property to all parties involved. This is simplified to the sharing of costs between the private sector (above the diagonal line) and public sector (below the diagonal line). The 'conventional' property package referred to above is the point of 'no land-based financing' on the diagram as the property developer finances only the cost of building, land and internal infrastructure. Land-based financing, in the broadest interpretation applied here, takes place as one moves to the right of the diagram with the private sector (developer and property owners) progressively financing connector infrastructure, bulk infrastructure and social and community infrastructure – components that would otherwise have had to be financed by the public sector. At the very left an assumption is made that the property development will also provide for a contribution towards the financing of infrastructure to support low income housing, whether this be part of the property development or external to it.

As one moves from the 'no land-based financing' position towards the left of the diagram this becomes what could be called 'reverse land-based financing' in the sense that the public sector, either the city or the state, is funding the internal infrastructure, land and ultimately the cost of buildings (typically housing units). More conventionally this can be considered a subsidy to the property owners.

Finally it needs to be noted that the order in which the components of a property development are layered is not important. For example, it is possible for a property developer to cross subsidise low income housing (typically within the development) but not bulk and connector infrastructure. This remains a form of land-based financing.

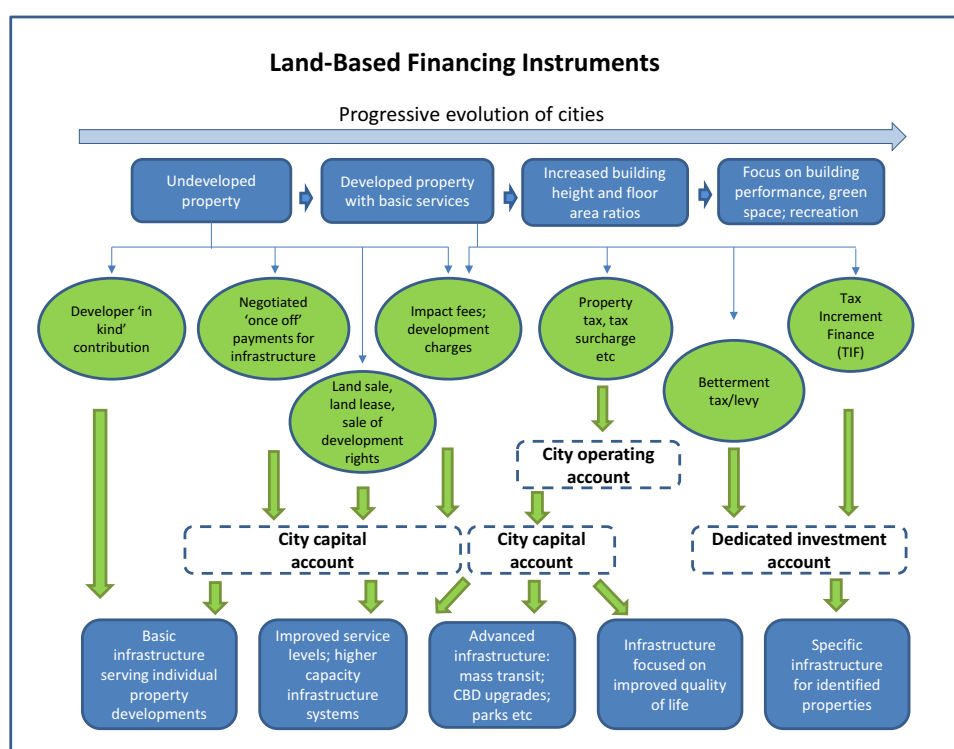
Financing instruments under the land-based financing umbrella

The term land-based financing incorporates 'land value capture' (LVC) which can be defined as a public financing method by which governments (a) trigger an increase in land values via regulatory decisions (e.g., change in land use or floor area ratio) and/or infrastructure investments (e.g., transit); (b) institute a process to share this land value increment by capturing part or all of the change; and (c) use LVC proceeds to finance infrastructure investments (Suzuki, et al 2015).

In addition to the land value capture component, land based financing includes financing of infrastructure by property developers, regardless of whether this increases the value of properties. Land based financing can also be seen as an umbrella term for a number of financing instruments which are summarised in Figure 9.

Figure 9: Diagram showing land-based financing instruments as they apply across the property development and infrastructure provision spectrum

Source: ACC (2015:12)



Some of the instruments are more effective for cities in the early stages of evolution and others become effective as cities evolve and have the more complex administrative arrangements in place to support these more sophisticated instruments on the right hand side of Figure 9.

Advantages, disadvantages and preconditions for the various sources of infrastructure financing

City's own finance (reserves and borrowing)

Advantages

Cities can plan and budget for infrastructure in a coordinated and strategic way with full control. They may be able raise finance at better rates than the private sector and pay for it over a longer period. In addition, cities are able to plan the total range of infrastructure, not only those that are specific to the development.

Disadvantages

Cities would need to build up substantial reserves to fund expensive infrastructure, resulting in a perception of cities as making 'profit', which is politically problematic. There is also an inter-generational problem where current ratepayers are funding investment in infrastructure for future ratepayers.

Preconditions

The precondition for the use of city finance is general financial health and sufficient revenue to be reinvested in infrastructure. Although cities with minimal revenue may still choose to invest some of it in infrastructure, where finances are constrained, revenues tend to be prioritised to cover operating expenditure.

Transfers and donations

Advantages

Depending on the conditions associated with the transfers or donations, national government or donors have some control over the investment. It is possible to direct significant sources of money (e.g. national tax revenue) into a strategic investment. There is no financial implication for the developer or ultimate beneficiary, which may be necessary to stimulate development or to benefit targeted groups.

Disadvantages

Transfers or donations introduce market distortions that may impact on other developments. The source of the transfer or donation (national or international taxpayers, usually) can be cross-subsidising private developers who may make a profit as a result of the subsidies.

Preconditions

The availability of transfers (from national government) and donations (from other governments or aid agencies) depends on the national policy and the policies of international development partners, but the level of transfers from national government to fund urban infrastructure is highly variable based on the health of the national fiscus.

Service provider funding (borrowing and equity)

Advantages

Service providers may have stronger balance sheets or access to discounted finance that may not be accessible to other parties. 'Ring-fenced' utility services can have reliable revenue streams that enable borrowing. The service provider also has the ability to plan and budget for their specific infrastructure service at a city-wide or even national scale.

Disadvantages

Cities or developers may be beholden to external parties (parastatals or private utilities) to budget and plan infrastructure. The priorities of the service provider may not align with those of the city or the development, resulting in stalling the development process.

Preconditions

The ability for service providers to provide either borrowing or equity depends on the reliability of the future revenue stream created by the infrastructure. PPPs only succeed where the private sector is guaranteed return on investment, or where state guarantees are provided to cover any shortfall. Typically, parastatals often do not have the fiscal resources or financial viability to raise their own finance and thus rely heavily on national government for finance.

Land-based financing

Advantages

The financing is provided by the actual users of the infrastructure and the incidence of the cost is therefore more equitable.

Disadvantages

Different types of land-based finance instruments have different disadvantages. Some of the instruments (like property tax or Tax Increment Financing) require complex administrative systems and capacity, while others (like 'in kind' contributions) provide an opportunity for abuse by either party. In addition, the financing of infrastructure by individual developers can result in infrastructure being provided in a fragmented manner that does not promote system integration and efficiency.

Preconditions

While individual land-based financing instruments can work even in cities where land use administrative processes are weak and fragile, they will work optimally in cities where the following preconditions are met (ACC, 2015:viii):

- "There is an effective demand for property, generated by the city's economy, as well as an effective supply of developable land, which is determined by the ease of access to land rights, the strength of the property development sector and access to property finance.
- There is a sufficiently effective state, providing regulatory, governance and policy framework that is conducive to land-based financing, as well as effective cities with the legal status, political support, and financial and technical capacity to implement land-based financing".

The preconditions vary considerably across the spectrum of land-based financing instruments. Simpler instruments such as 'in kind' contributions from property developers require limited involvement of the city: the developer builds the required connector infrastructure and sometimes bulk infrastructure. Ideally this should take place in line with city infrastructure plans. But even this may not happen. On the other hand, more complex instruments require relatively sophisticated city administration systems to collect revenue and accumulate capital in structured accounts to be used to finance infrastructure. Some instruments, such as land lease and land sale, have quite specific conditions: the city or national government needs to own the land before it can be leased.

In addition to certain financing instruments being applicable in certain contexts, certain methods of financing are more suited to certain components of infrastructure, as discussed in the table below.

Table 4: Suitability of finance mechanisms for each service

Source: ACC (2015:15)

Type of infrastructure	Type of service	City ¹	Parastatal ²	Land-based financing (LBF)	Developer ³	Transfers & donors	Comment
Bulk	Water and Wastewater	L	M	L		M	Normally provided by parastatals in. While these parastatals should raise their own finance, they seldom do this at sufficient scale. They are, therefore, reliant on donors and transfers with small potential for contributions from city sources and LBF.
	Electricity		H			L	Normally a national function in, with service provision by national parastatals. These parastatals should be self-funding, at least for bulk infrastructure, but in reality most are reliant to some extent on transfers and donors.
	Distributor roads	L		L		M	These are the higher order, high-traffic roads in the city. While there is some potential for city-sourced funding and LBF, these roads are often funded from national transfers or loans, or by donors. There is also potential for toll roads.
	Public transport			L		H	At this stage of development, public transport infrastructure, particularly mass transit systems, is most likely to be funded by donors and transfers (including loans taken out by national government). However there is potential for LBF through betterment taxes (in South Africa specifically).
Connector		L	L	H		L	Ideally suited to LBF, as the infrastructure is strongly associated with property developments. But this infrastructure may also be funded by parastatals in the case of water, wastewater and electricity. There is some potential for contributions from city sources and from transfers.
Social and community		H		L		M	Often funded from city sources, but national government plays a significant role, particularly if the function is national. Some potential for LBF.
Internal	Commercial and industrial				H		Should be funded by the developer as part of their primary obligation, prior to applying LBF.
	Mid- to high-income residential				H		As for commercial and industrial property.
	Low-income residential	L		L	L	H	Low-income residential property developments are seldom undertaken by developers, who can raise capital themselves. But there are examples of informal property developments where internal infrastructure is funded by the community. There is low potential for this to be funded from city sources and LBF. As the social benefits of funding this infrastructure are so high, the role of national government in funding this infrastructure through transfers is most important.

1. Includes direct use of operating surpluses and debt finance.

2. Debt finance, equity with possible support from state and donors.

3. This is the minimum contribution by the developer before LBF is applied.

4. Analysis of the Application of the various Infrastructure Financing Approaches

Types of alternative infrastructure financing

The above property developments show a range of different financing arrangements which are applied in providing bulk, connector and social and community infrastructure. Broadly, they fall into four groups:

- The conventional model where the city (together with national government and parastatal service providers) provides the infrastructure. (Sawa Beach, Cameroon)
- The conventional model with additional subsidy applied by the national government to fund internal infrastructure and land or, in one case, the building. (Kilamba, Angola; Arcon Ville, Benin; Gaposho Estate, Rwanda)
- Models where land-based financing instruments are being applied in one way or another with the developer paying market price for the land. (Lideta, Ethiopia; Carlton Gate Estate, Nigeria; Two Rivers, Nairobi; Riverstone Villas, South Africa)
- Models where land based financing is applied but the developer gains access to subsidised land. (L'operation les floraisons, Cote d'Ivoire; Gacuriro, Rwanda; Budiriro, Zimbabwe)

The land-based financing instruments applied fall into three of the categories shown in Figure 9: 'in kind' contributions by developers; developer charges and land leasing.

Examples of the conventional model

L'operation les floraisons is an example of a conventional infrastructure financing arrangement whereby the State (not the City) provides bulk infrastructure and the developer provides internal infrastructure. However, the fact that the state provided some of the land for free and provided other financial assistance to the developer, results in a land-based financing rating of -1.

The case of Kilamba illustrates an example of heavy state funding of land and infrastructure, albeit through a novel finance mechanism linked to the country's valuable oil reserves. While the sale price of the units would have recouped some of this initial state investment, it is not clear whether the total revenue from the project would have covered the full cost. However, the fact that the sale price was lowered and subsidised rental schemes were offered suggests that the housing top structures may have been subsidised as well. It is therefore concluded that Kilamba represents a case of 'reverse' land-based financing and in terms of the scale proposed in Figure 8, would receive a rating of -4. The rationale for these heavy state subsidies appears to be the inability of the market to provide the serviced property at the required scale, and the availability of capital funding on the back of oil reserves to make the investment possible. This funding mechanism is therefore potentially specific to resource-rich countries with large housing backlogs in the lower end of the market.

The Arcon Ville case study is an example of national government led development relying heavily on state and city funding as a catalyst for future revenues, but this is highly reliant on there being available capital from all partners. This approach is categorised as level -3 land-based financing because the state provided subsidies on land, bulk and internal infrastructure and top structure, but the private sector also put up funding for top structures and some internal infrastructure.

The case of Gaposho Estate Phases I & II contrasts starkly with the other case from the same city (see below), where the developer provided most of the infrastructure. Because the state provided all bulk and connector infrastructure, this is a conventional infrastructure provision arrangement, but because the state also provided the land at no cost, the land-based financing rating is assessed to be level -2. The motivation for the state subsidisation of this development appears to be the provision of affordable housing for returning genocide victims.

'In kind' contributions by developers

An 'in kind' contribution from a developer occurs where the developer actually builds one or all of required bulk, connector, social and community infrastructure required for the property buyers to get access to a functional living environment. The examples of this include:

Two Rivers in Nairobi is a classic case of land-based financing with 'in kind' contributions from the developer including all the connector infrastructure and water and sanitation bulk infrastructure. It appears that the developer is providing almost all the infrastructure themselves in order to get the project to be viable.

The Carlton Gate Estate in Lagos is an example of the developer providing more than required in the conventional package of infrastructure, including some bulk services, but not extending to social services or cross-subsidisation of low-income infrastructure. The developer provided connector infrastructure and also contributed to community infrastructure⁵. Land was acquired at market price. Land-based financing has thus taken place through 'in kind' contributions, but is evidently also taking place through property tax on the rapidly increasing property values. The consequent land-based finance rating is thus 3.

⁵ Under the Planning Statute in Nigeria, developers are expected to provide 'in kind' contributions as Planning Gain to neighbourhoods where large scale developments are proposed, however this is changing and there is, evidently, a move towards a once-off tax which would imply a development charge if the tax was used to fund infrastructure.

At Gacuriro Estate, Kigali the developer provided most of the bulk, connector and internal infrastructure, and therefore level 4 land-based financing can be said to have taken place. This significant developer investment is only offset by the initial contribution of the land by the state and the fact that the developer did not contribute to social infrastructure or cross-subsidising other development. Budiriro Housing Estate in Harare represents an extreme example of land value capture where in-kind contributions are made to the bulk, connector and social infrastructure because the city council is not in a position to provide this. In addition to this infrastructure, which benefits a wider area than the development alone, the developer is required to pay a type of development charge (although more like a tax) in the form of an endowment fee. In spite of this significant contribution, the fact that the land was provided to the developer below cost means that the land-based financing rating for this project is neutral (0).

These case studies did not include interviews with participants to assess the reasons for the developer providing the infrastructure. However, the evidence is that this has been fairly standard practice in Lagos, Nairobi and Harare as the cities do not have the resources to provide the infrastructure. In the case of Kigali the approach cannot be considered standard practice as the city has provided infrastructure to other developments (Gaposho Estate, for example). In all these cases the developer had little choice: the only way the property developments could proceed was with 'in kind' contributions. The implication of this type of 'in kind' contribution is that the developers can only provide middle to high income housing as a result, unless another cost (such as the cost of land) is subsidised by the state.

Use of land lease to fund urban infrastructure

Land leasing is applied in two countries where case studies were undertaken, Ethiopia and Cameroon.

At Lideta, Addis Ababa, the national government owns the land and the property owners must lease the land for varying terms. The revenue from this must be used to fund urban infrastructure or the provision of low income housing. In the case of Lideta, the revenue raised through leasing to the commercial and non-poor housing owners is put into an infrastructure fund. This funds a portion of the infrastructure required for all property developments in the City. The Ethiopian case represents a very specific type of land-based financing: land lease. Because the auction of the lease results in payment above the cost of infrastructure, this revenue can be used to cross-subsidise infrastructure to serve low income housing. The case study therefore receives a land-based financing rating of +4.

While the case study of Sawa Beach, Douala indicates a 'conventional' infrastructure model, it is not specific about how the various components of infrastructure are financed by the City of Douala. However, Cameroon applies a land lease system, whereby it converts a portion of 'national' land to leasable land. This money is paid as a once off fee based in the area of the site, at a rate which varies inter- and intra-city. The purpose of this revenue is not stated and, therefore, there is no certainty that the funds raised are used for urban infrastructure.

Development charges

A development charge is a financial exaction from the developer at the point of development approval, and as a condition for development approval. It is in the nature of a benefit tax where the tax is targeted at a specific category of expenditure which benefits the specific tax payer, in this case the property owners. The charge should relate to the actual cost of providing infrastructure for specific situations. This is known as the 'rational nexus' (Libby & Carrion, 2004). This has been applied in some form or another in the following case studies:

The case study of Riverstone Villas in Cape Town shows a very conventional application of a development charge by formula according to a city-wide policy. As the developer contributes toward bulk infrastructure in addition to the cost of land, buildings and internal infrastructure, this development has a land-based financing rating of +3. The charge is intended to approximate the actual costs of the infrastructure demanded by that development and no more or less. This example is similar to approaches used internationally (e.g. Impact fees in the USA and development charges in New Zealand).

At L'opération les floraisons in Abidjan the case study indicates that the national government provided the infrastructure. However, developers in Côte d'Ivoire do have to pay towards this through an urban development levy, the proceeds of which are to be used to finance urban infrastructure. This once off payment is due from every property developer prior to the commencement of the development and is a condition for the granting of building permit by the local council⁶.

Unsuccessful examples of charges associated with development are the endowment fund in Zimbabwe and the infrastructure levy in Kenya. Both require a financial contribution towards infrastructure. The endowment fund in Zimbabwe most often gets used for the payment of administrative operating expenses, primarily salaries, and the infrastructure levy in Kenya is not often enforced and therefore is frequently avoided, with the funds that do arise going to other places. Therefore in both cases the funds are not made available for infrastructure to the case study property developments and hence the developers have had to fund part of the bulk and connector infrastructure themselves.

⁶ In addition, the developer has to pay a special 'equipment tax' (taxe locale d'équipement), 50% of which is due prior to the granting of a building permit, while the remainder is due before issuance of a certificate of occupancy.

5 Evaluation

Conventional model

Discussion

The conventional model of infrastructure provision is still being applied in sub-Saharan African cities despite there being insufficient funding or borrowing capacity to provide the required infrastructure. The reasons for this approach may largely be historical (the way it has always been), but in many cases the motivation seems to stem from the notion that the government can stimulate or promote economic growth and development through the provision of bulk and connector infrastructure. Where this argument is taken one step further is where developers are given access to subsidised land in addition to bulk and connector services, which appears to happen in a surprising number of the case study projects. In other cases the intention, at least initially, is to provide housing to address the shortages in the lower end of the market, and the government as the developer of this housing has to provide the infrastructure for this.

Advantages

The conventional model has the advantages that the government has control over the location and form of the infrastructure, thereby improving network efficiency. The government can also control the location and type of development the infrastructure supports. National or local government can access preferential interest rates for cheaper finance with more favourable terms.

The government can also provide this infrastructure as an incentive for development, effectively reducing the up-front development costs in favour of longer-term repayment by the end-users and not the developers.

Disadvantages

The government may not have the money available or the ability to raise finance for this approach. Future revenue streams from the investment may also be uncertain. As investments are recovered from property tax and service tariff revenues from across the city, existing residents will also be burdened with repaying the costs of infrastructure expansion.

Preconditions for application

The model requires the level of government responsible for the infrastructure (local, national or parastatal) to have sufficient revenues or healthy balance sheets to be able to raise capital to provide this infrastructure. The government also needs comprehensive infrastructure plans and a good sense of demand in space to avoid wasted expenditure.

'In-kind' contributions

Discussion

'In kind contributions' represent a default position to cater for government failure to provide bulk and connector infrastructure. The presence of 'in kind' contribution can therefore be seen as an indicator of government dysfunction. However, there may be other reasons for local government to require in kind contributions, including the expediency of using the contractor already on site and the avoidance of cumbersome procurement processes and bureaucracy involved in government infrastructure provision (in South Africa, for example). Therefore, 'in kind' contributions, if well managed, can be an appropriate and effective land-based financing mechanism.

Advantages

Expediency and direct attribution of cost to the developer demanding the infrastructure.

Disadvantages

Problems with equity: sharing the infrastructure with other property developments, particularly bulk infrastructure. Possibility of corruption. Risk of sub-standard infrastructure being provided. Irregular provision of infrastructure can lead to unplanned and inefficient networks, so-called infrastructure 'islands' that eliminate advantages of scale.

Preconditions for application

Adequate city planning. Comprehensive engineering standards that are enforced. A written agreement regarding the scope, standards and timing of the infrastructure provision and any payment offsets that result from the infrastructure provision. A transparent process for handover of the assets created to the municipality.

Land leasing

Discussion

The case of Ethiopia illustrates that land leasing is a viable means of infrastructure financing through land-based financing. However, the revenue raised from the leases contributes only 20% of infrastructure cost with the remainder coming from national transfers in the form of a tax sharing arrangement. This instrument is unfortunately not applicable in many countries as land is not owned and controlled by national government. However, it is being applied in Cameroon, which is under-researched and requires further investigation.

Advantages

Ability to leverage high value land to raise surplus and cross-subsidies. Long term source of revenue.

Disadvantages

State land ownership is required. Can be administratively complex.

Preconditions for application

State land ownership in strategic locations. Disciplined ring-fencing of revenue raised for infrastructure provision.

Development charges

Development charges have the potential to provide a viable alternative to the conventional infrastructure financing model. If correctly applied in terms of a policy and formula they have the potential to be equitable and transparent, as has been illustrated by widespread application internationally. However, the case studies indicate that, with the exception of South Africa, they are applied rather arbitrarily without a clear policy and often without ring fencing the funding for urban infrastructure.

Advantages

Can be applied uniformly across cities. Equitable in that only new developers pay for new infrastructure. Finance is provided up front for infrastructure to serve an explicit demand.

Disadvantages

Increase in development costs may discourage development and raise sale prices of housing units. Can be difficult to calculate and administratively complex. Opportunity for corruption.

Preconditions for application

Adequate city master planning. High level of local government technical and administrative capacity.

6. Conclusion

The financing of infrastructure that serves housing development is determined by factors at play well beyond the immediate scope of any particular housing project. These factors range from the health of the national fiscus as a determinant of the ability to use national transfers, to the balance sheet of local government as a determinant of the ability to borrow on the capital market. The fundamental choice that a local government⁷ makes is whether to follow the conventional approach of providing bulk connector and social and community infrastructure to facilitate development, or whether to use the development process to raise the required capital (or parts of it) through land-based financing. The ACC study found that the application of land-based financing in resource- and capacity-constrained sub-Saharan African cities is limited as the preconditions are generally not met.

The ACC report proposed a modest approach to building and strengthening land-based financing by introducing and supporting development charges as the intervention with the greatest potential for relatively immediate, positive impact. These charges can cover the investment in connector, bulk and social infrastructure, additional to that which is required within the property development. Of these three, investment in the connector infrastructure is likely to be the easiest to implement in the short-term. In some countries the introduction of development charges will be an innovation, in others it will require the strengthening of existing instruments. In most of the countries where in-kind contributions to urban infrastructure are the norm, the value of these in-kind contributions can be offset against a development charge, which means that there will be relatively few shocks in the introduction of the system. Over time a system of development charges will build the basis for cities to explore and implement additional, complementary land-based financing instruments. From the platform established by a system of development charges that effectively covers the costs of infrastructure it is then possible to build a more comprehensive system of value-capture instruments that start to share the land value increases created at least in part by the provision of infrastructure.

⁷ This decision is made at the local government level if local government has the responsibility for infrastructure provision and the land development approval process. If, however, the mandate for infrastructure provision lies with national government or a parastatal, then it is possible that the decision lies outside of local government, but the decision is complicated if local government controls the land development process and the trade-off is not as simple.

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Appendix – Case study detail table

Country - City	Project name	Project type	Project size	Type of developer	Land provision	Infrastructure provision	Land-based financing
Angola Luanda	Kilamba	Mixed use but primarily housing project	Large scale	Angolan State (central government) with Chinese loan funding and Chinese State-owned contractor.	Provided free by the State	All infrastructure provided by the State.	Level -4 All land, infrastructure provided by the State houses sold at subsidized rates
Benin – Cotonou	Arcon Ville	Housing – intended for low to middle income but not affordable to low income households	Large conceptually (5,000 units). Phase 1: 2,100 units	Low risk – mainly builder	Land provided by government	Public – local council	Level -3 Reverse land-based financing with developer only providing building of houses.
Cameroon Douala	Sawa Beach	Mixed use – mainly housing mid-high income	1,000 ha; 10,000 housing units + commercial + industrial	Private developer but with Douala City owning shares in developer and with risk taking only on top structures.	Provided by government at no cost to developer	City and State fund infrastructure and 25% of top structure; developer funds top structure (75%)	Level -4. Reverse land-based financing with government providing all infrastructure and subsidising housing.
Cote d'Ivoire Abidjan	L'opération les floraisons	Housing – some commercial	Middle sized: 3,000 'social housing' + institutional +commercial	Private developer – SOVERD Group but with strong assistance from State (including access to finance)	Purchased from traditional owners	Bulk and connector infrastructure provided by State	Level -1 No land-based financing; strong State support
Kenya Nairobi	Two Rivers	Mixed use – commercial & high income residential	Medium – 85ha.	Private – Centum Developments	Uncertain – suspected purchase at market value	All internal and bulk infrastructure provided by the developer	Level +3. Developer provides bulk and connector infrastructure 'in kind', but not serving other areas.
Nigeria Lagos	Carlton Gate Estate	Mixed use – mainly housing middle – high income	Small – 231 units	Private developer in consortium with a Chieftaincy family who own land	Provided by Chieftaincy family	Developer provides houses and internal infrastructure and some bulk and connector. Uncertainly over sanitation. Lagos State provides freeway. The developer provided the drain channel connecting with the municipal channel but no sewage treatment plant	Level 3 Developer provides some bulk and connector and pays State land use charge

Appendix – Case study detail table

Country – City	Project name	Project type	Project size	Type of developer	Land provision	Infrastructure provision	Land-based financing
Rwanda Kigali	Gacuriro Estate Phase I	Housing – Middle to high income	Small: 100 units in Phase I 21.76 Ha	Parastatal: Rwanda Social Security Board (RSSB). RSSB is an independent government institution and receives and manages pension funds of workers in Rwanda	Expropriated land, well below market price	The developer funded the bulk and connector infrastructure with cost recovered through purchase price from purchasers	Level 4 Developer provided bulk and connector infrastructure, but land was heavily subsidised.
Rwanda Kigali	Gacuriro Estate Phase I	Housing – Middle to high income	Small: 100 units in Phase I 21.76 Ha	Parastatal: Rwanda Social Security Board (RSSB). RSSB is an independent government institution and receives and manages pension funds of workers in Rwanda	Expropriated land, well below market price	The developer funded the bulk and connector infrastructure with cost recovered through purchase price from purchasers	Level 4 Developer provided bulk and connector infrastructure, but land was heavily subsidised.
Rwanda Kigali	Gaposho Estate Phases I & II	Housing – Middle to high income	Size not given in report but assumed to be large	Government umbrella developer with subsidiary private developers	Government provided land at no cost to developer	All bulk and connector provided by Government. Internal provided by developer	Level -2 Reverse land-based financing: no contribution to bulk and connector and land subsidised
South Africa – Johannesburg	Cape Town	Middle to high income	Small – 51 units	Medium-sized private developer	Purchased at market price	City provided all bulk and connector infrastructure	Level 0. Developer made calculated capital contribution to all bulk infrastructure, but not to social infrastructure.
Zimbabwe, Harare	Budiriro Housing Development	Housing meant to be low income but more middle income	About 3,000 units with three options for top structure	City of Harare JV with CABS (Old Mutual subsidiary)	Provided to developer at low cost	Connector infrastructure as part of the project	Level 0 Neutral as developer provides some connector infrastructure but gets land at below cost