



## Urbanisation in Africa – Taking Angola as an Example

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### Abstract

Taking Angola as an example the paper offers an insight into how the issue of dramatic housing shortages and population density imbalance across African countries, that frequently result from prolonged civil wars, is being addressed. Some of these efforts, by and large driven by populist political expediency, are misguided and likely to lead to long term socio-economic problems. Many new towns and cities created through this process are far from being resilient or smart. They merely provide statistical data as to the number of units created, and have no regard for living conditions and social cohesion in the long run, or the life-time viability of what has been built. The 27-year Angolan civil war, ended in 2002, led to the destruction of most of the country's infrastructure and resulted in a major housing crisis, especially in the capital Luanda, where 21% of the country's population lives at present. The Angolan government is engaged in a program aimed at decentralising the population. This involves creating new towns and settlements, new road networks etc. Most of large volume housing built at present in Angola is built by Chinese entities and mimicking the Hong-Kong/China high-rise, which is inappropriate for the climatic and socio-economic reality of Angola. These are normally bedroom estates i.e. not fully functional multifaceted urban organisms.

**Keywords:** Urbanisation, Housing, Population Growth, Social Resilience, Decision Making Competence, Design Competence, Cultural and Climatic Appropriateness, Town, Cities

### 1 Introduction

Population growth is closely linked to growing urbanisation, and rapid urbanisation is one of the current megatrends. Provision of adequate housing constitutes one of the biggest challenges for all countries, from the likes of the UK to the poorest nations. A challenge that is highly political and affects slum dwellers in the developing world as well as middle-income households in expensive global cities. Hundreds of millions of people struggle to find decent housing that is affordable without crippling financial commitments. The economic, societal and human impact of lack of affordable housing is enormous. McKinsey Global Institute in its October 2014 Report -A Blueprint

for Addressing the Global Affordable Housing Challenge, estimated that "some 330 million households are affected around the world and, under current trends, by 2025 the number of households that occupy unsafe or inadequate housing, or are financially stretched by housing costs could reach 440 million - or 1.6 billion people." By 2025 there will be some 40 cities with population larger than 10 million. The global rise of cities has been unprecedented. In 1800, 2% of the world's population lived in cities. Now it's 50%. Cities occupy 0.5% of the world's surface, but consume 75% of its resources. Every week, some 1.5 million new people join the population of cities, through a combination of migration and childbirth. The numbers living in urban slums

have risen by a third since 1990. Over the next decade, New York, Beijing, Shanghai and London alone will need US\$8 trillion in infrastructure investments.

## 2. Urbanisation in Angola

Angola's land area at 1,246,700 km<sup>2</sup> is twice the size of France, and its population count according to a 2014 census is presently standing at 24,383,301. Angola's population density is thus 14.8/km<sup>2</sup> which makes it 199 lowest in the world. Prior to his re-election in 2008, President Eduardo dos Santos pledged to build '1 million homes'. The original plan was to build 685,000 homes as self-built, 185,000 by the government, 120,000 by the private sector, and 80,000 by housing co-operatives. Gabinete de Reconstrução Nacional, which falls under the Presidency, is in charge of Angola's key infrastructure projects including the new international airport and three railway lines, as well as the '1 million homes' programme. A total of 100 000 hectares of land around Luanda, Benguela, Namibe, Lubango and Malange has been earmarked for the programme, which involves satellite towns, called 'new centres' (*novas centralidades*) or 'new cities' (*novas cidades*). Five satellite towns near Luanda and the majority of those being built in the provinces are constructed by Chinese state-owned companies and their Chinese subcontractors. These satellite towns and other infrastructure projects are financed by Chinese oil-backed loans, either under China – Angola bilateral agreements or through private contracts. It would be interesting to observe how the hard currency difficulties suffered by Angola as a result of low crude oil prices impact on the urbanisation of the country.

### 2.1 Kilamba

Kilamba Kiayi is a component of that presidential promise. This \$3.5 billion project, a mega satellite town being built 20 km from Luanda's centre, is a flagship housing project for both China and Angola. It is the biggest project thus far built by the Chinese outside of China. 710 buildings with 20,000 apartments were completed by September 2012, when the project hit the media as a 'Ghost Town'. 3.3 million m<sup>2</sup> built in the first phase is spread over 5 km<sup>2</sup>. It is divided into 28 urban

blocks of about 16 hectares each set on a rectilinear grid. There are three types of apartments in three types of buildings ranging from 5 to 11 storeys. The project includes also 24 kindergartens, 9 elementary schools and 8 middle schools, and supporting infrastructure consisting of 2 high voltage transformers, 77 power substations, 400 km of water pipes, a water sewage plant, traffic lights, and bus stops. The project is frequently presented to African leaders visiting Angola as a social housing model. The second phase currently underway consists of a further 5,000 housing units.



Figure 1. Kilamba

Initially Kilamba was to be financed by China International Fund (CIF), a private investment fund based in Hong Kong however in 2008, when CIF ran into financial difficulties, the project was taken over by CITIC Construction, a subsidiary of the state-owned CITIC Group, and financed by the Industrial and Commercial Bank of China. Payment of the Chinese loans bypasses the Angolan government, with the Chinese banks paying the CCFs in China directly. Repayment of the loans is guaranteed by oil sales to Unipecc, the trading subsidiary of the Chinese oil firm Sinopec. Angolan oil is not used directly for loan repayments, but as the collateral for servicing the loans. Although this funding formula is not unique to China, the Chinese model is distinct in that it involves a 100% state financial circuit (from the lending institution and contractors to the off-taker).

### 2.2 Dundo

The town of Dundo, in north east province of Luanda Norte, near the Angolan border with the Democratic Republic of Congo, was founded near a site where diamonds were first discovered in

1912. Until 1980 the Dundo mines produced annually nearly 10 percent of the world's total output of gem-quality diamonds. The Dundo Social Housing is a new project built on 117 hectares of land, realised in two stages. It is to provide accommodation for some 30,000 residents. Construction begun in 2008 by the Chinese company Pan-China Construction Group Ltd for Sonangol Imobiliaria e Propriedades Lda (SONIP). The project, of which about 1/3 has been realised, involves four basic types of residential buildings: 5, 9, 11 and 18 storeys high. In addition



Figure 2. Dundo at street level

also a hospital and schools were built, as well as infrastructure consisting of water supply system, sewerage network and sewerage treatment plant, roads, pavements and landscaping. Alarmed by apparent structural issues emerging during construction, SONIP engaged UK engineering expertise to investigate. In the process also sewer issues were uncovered. The main structural issue seems to stem from the fact that Chinese design codes were used and that buildings designed for certain heights were 'extruded' to create higher structures.

### 2.3 Critical review of Kilmaba and Dundo projects

While poor design, low construction standards, and disproportionate cost of flats were the issues that hit the media and attracted significant public interest, the true problems are much more complex and not easily discernible by a lay person, and clearly out of the vision field of the decision making politicians. Put against sustainable urban design principia both Kilamba and Dundo housing schemes fail on practically all counts. Analysing just three key issues demonstrates how basic

design faults with these two projects are very likely to lead to long term socio-economic problems.

#### 2.3.1 High rise

Transplanting the Chinese high-rise residential model to a country with one of the lowest population densities on the planet and a society where all social interactions always took place at ground level, is misguided and clashes with the life style of the Angolans.



Figure 3. High-rise housing outside of Beijing

There are several issues of concern. At the basic practical level - high rise relies on power for lifts and air conditioning. Power outages are the norm in Angola and are likely to be so for years to come. How do aged residents and visitors, mothers with prams get home if living on the top floors of towers? Maintenance - if the accommodation was in houses, even vertically detached of, say, 4 storeys, the owners/residents could take care of their building themselves as all elements of the building could be reached. How do you repair a leaking window or a façade defect on 10<sup>th</sup> floor? Nobody will ever erect scaffolding to this height to deal with a leaking window. Thus deterioration will continue. This, as well as the need to maintain mechanical devices like lifts, translates into maintenance and ownership cost not affordable to a great proportion of the residents.

There is then the issue of the individual residents being prevented from deploying energy generating devices at their own cost and for their own use, like solar water heaters or Photovoltaic panels, which they could do on individual houses but not on high rise blocks.

The sheer concept of mass high rise here is damaging to social cohesion. There are numerous



examples of houses built in Angola by property developers with fitted kitchens, where the kitchens are never used as home cooking takes place outside. How, for example, can this tradition be accommodated in a high rise block of flats ?

### 2.3.2 Urban site planning

Orientation – at this geographical location east and west sun penetrates deep into the flats, resulting in residents blacking out so oriented windows, electrical lights being put on, and heavy reliance on air conditioning, in a country where power outages are still the norm. Orientation of buildings in Kilamba and in Dundo is random and does not seem to have been guided by any environmental planning principles.



Figure 4. Aerial view of Kilamba

Urban planning at Kilamba gives the impression of buildings being randomly thrown onto square patches, almost like dice, with no rhyme or reason, with no attempt at creating sense of urban environment, with no active frontages along streets to create urban street life.



Figure 5. Kilamba at street level, note absence of active ground floor frontages

Another result of such random placing of buildings is the spatial confusion that it creates, making it difficult for the residents and even more so for

visitors, to orient themselves. Colour coding of buildings in Kilamba seems to be an attempt at softening this self-inflicted shortcoming. In cities crime control is best enacted through overlooking and visual control of street environments. When residents are out at work people working in the area in shops, offices etc provide the visual supervision. When these people go home the residents come back home and they deter crime by way of visual supervision. In monocultural environments such as the Kilamba and the Dundo bedroom estates such natural, cost free and organic crime prevention is not possible.



Figure 6. Kilamba 'colour coding'



Figure 7. Dundo aerial view

These two master plans were drawn up by urban planning and design institutes based in China, which still use outdated social-realist concepts such as zoning, rather than mixing uses. In

In addition, the large-scale urban blocks are bigger than European or African urban grids. According to available reports, Angolan planners faced difficulties in convincing the Chinese design planners to design in harmony with the local context and traditions.

### 2.3.3 Location

Locating urban developments correctly is the most critical step in developing successful urban entities. Indeed, if the decision about development land location is wrong, urban and housing projects cannot succeed, no matter how well construction, operations, and financing are managed. Projects must be built where residents can reach jobs within reasonable commuting times, families have access to schools and vital services, and people can connect with the society around them. Both Kilamba and Dundo are in essence huge bedroom estates located long distance from work places. They are not 'cities'. This is detrimental not only to environmental protection, creating high levels of transport-generated pollution, but more importantly to the social cohesion and family life of the residents. It can take 3 - 4 hours to get to work in Luanda from Kilamba. This means a 6-hour commute every day. How are parents to interact with children when they leave at 5:00 in the morning and come back at 9:00 at night? How are people to interact in a meaningful way with their spouses? This scenario is likely to lead to social problems in the long run.



Figure 8. Commuting from and to Kilamba

## 3. Eco Town planning as an alternative

Urban development patterns are a primary factor in setting out sustainable energy policies. Drawing from the Angolan National Adaptation Programme of Action (NAPA) under the UN Framework Convention on Climate Change (UNFCCC) 2011 and the ANGOLA'S NATIONAL COMMUNICATION TO THE UNFCCC, Angolan urban development proposals should be conceived as Energy and Resource Efficient Eco-Towns. The following aims should constitute VISION and FUNDAMENTALS for all urban development projects :

1. Model Development Sustainable Socially, Environmentally, Economically
2. Mixed Uses With Active Frontages, Landmarks, Vistas And Focal Points
3. Alignment With Forces Of Nature
4. Extensive Planting And Creation Of Bioactive Land As Part Of Infrastructure
5. Creation Of Recognisable Places And Legible Connections
6. Creation Of Coherent Neighbourhoods With Local Character Of Distinction
7. Scope For Coherent And Harmonious Future Expansion Of The Plan

Studio Bednarski was commissioned to generate master plans for four new towns in Angola. The authorities will implement all infrastructure and lay out all construction plots, which will then be sold to developers, who will design and build buildings in accordance with an urban code developed by Studio Bednarski. These are the projects, all which were based on the seven principles listed above:

- Canhoca, Kwanza Norte Province, Cazengo County
- Bimbe, Huambo Province, Bailundo County
- Ngandavila, Calima, Huambo
- Quirima, Municipio do Cazengo, Provincia do Kwanza Norte



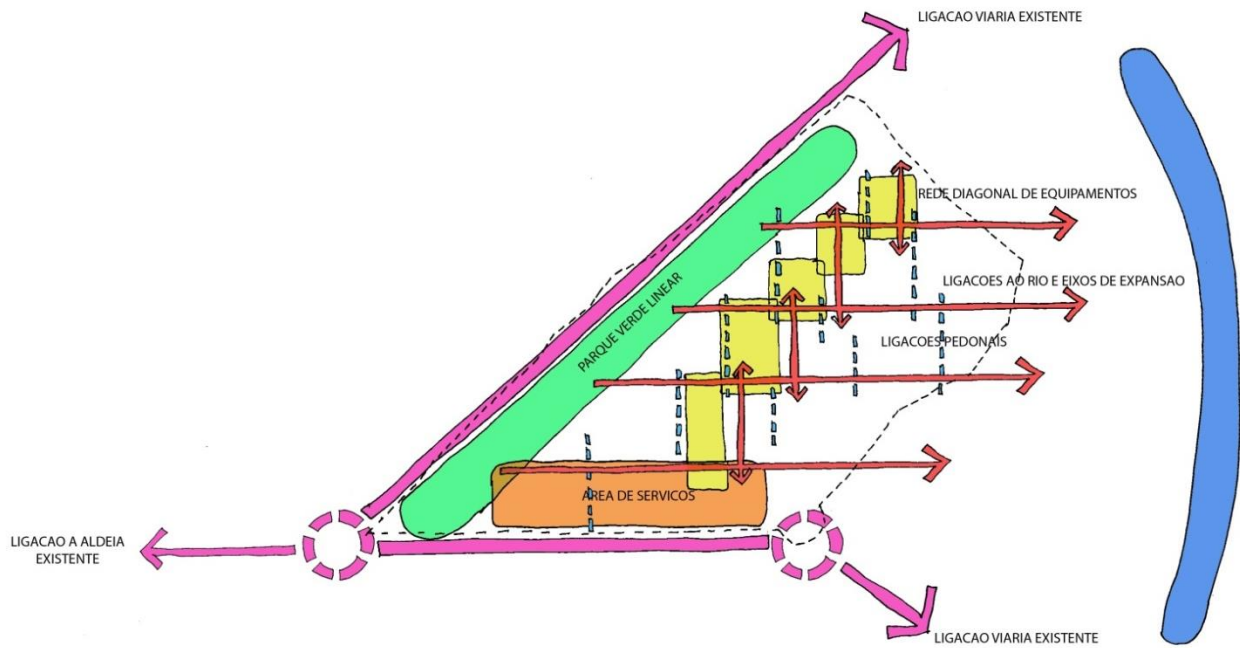


Figure 8. Bimbe Eco-Town functional analysis



Figure 9. Bimbe Eco-Town use matrix

### 3.1 Plot orientation

The street pattern of these master plans was oriented so as to enable east and west facades, which normally suffer from excessive solar gain, to be defensive, with no, or minimal, fenestration. The aim was to improve internal comfort in buildings and homes, while reducing the use of electricity for artificial lighting and cooling. North-South oriented buildings also facilitate easy installation of solar water heaters and, if economically viable in the local context, also Photovoltaic panels.



Figure 10. Bimbe Eco-Town – active green spaces

### 3.2 Trees and landscaping

An urbanised environment creates its own microclimate and air temperatures in built up areas can be much higher than temperatures in the surrounding rural countryside. Urban design can have a significant impact on urban climate. Trees, green spaces and areas of water can significantly cool the built environment and save energy. It was the prerogative of these projects that semi-mature tree planting and landscaping was treated as a vital part of the initial enabling investment on a par with the road network and the network of utilities infrastructure. This covered tree planting to all streets, to recreation

grounds, screen planting to the utilities infrastructure zone and to the roads. We proposed also that in order to set up the 'seeds of landscaping' for the private free-standing houses also these plots each received a minimum of 3 to 5 semi-mature trees per plot, the cost of which would be added to the sales prices of these plots.

### 3.3 Transport

Transport is a major contributor to air pollution and the main cause of accidents. While the land areas covered by these four master plans was too small for a dedicated local public transport network all of the areas within the plans can be reached by foot or bicycle, which shall be encouraged as the main means of transport locally.

## 4. Conclusions

Large-scale urban projects on the scale of Kilamba and Dundo could represent a component of a broader multifaceted strategy aimed at providing much needed housing for the emerging middle class in fast-developing African countries but the way in which they are procured, designed and delivered has to be reviewed and refined.

These two projects should be treated as a valuable learning opportunity not only for African urbanisation strategies but also for Chinese projects overseas. They could be used also as pointers for international aid providers involved in upgrading unplanned urban areas and with urban renewal. Many useful synergies could be derived from studying these projects to the benefit of African urbanisation needs, provided all stakeholder are recognised and willing to co-operate.

The critical areas for improvement include life-time planning both in terms of economics as well social issues including:

- Cultural and climatic appropriates
- Appropriateness of scale
- Living towns and cities, with a mix of intertwined living, working, educational and cultural uses, not bedroom estates
- Firm and enforced environmental agendas and this includes encouraging and empowering residents/owners to reduce use of grid energy through ease of

installation of autonomous energy generating devices.

- Appropriate construction technologies, which facilitate also basic maintenance by the owners/users who are best placed to deal with minor issues as soon as they arise
- Empowerment of residents so that they can and are able to take ownership of the projects ( according to the available data both Kilamba and Dundo were top-down projects imposed on the end users and in none of them the end users were offered any say in expressing their preferences at the initial brief, design or implementation stage )
- The cultural psychology of 'Ownership' must be taken into account. For most people Ownership starts at their home's front door, whether a house or a flat in high-rise. How this impacts on the treatment and care of common areas in high-rise blocks must be considered at design stage.
- All such projects should be seen as an opportunity to offer training ground for new advanced skills for the local people and should benefit the local economy not just remote entities, which in case of Kilamba and Dundo were Chinese entities.
- Transport and travel times for work education and culture must be at the forefront of the initial decision making at the stage of land identification for such projects. Long commuting times have severe detrimental impact on the health of family life and so by extension also on social cohesion.
- Quality urban design, architecture and functional internal layouts that are informed by and suited to the way of living of the future residents and users.
- Expert review process of design proposals before they are approved for construction. Such review panels should consist of architects, urban planners, civil, structural and environmental engineers as well as representative groups of end users.

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