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Maputo Urban Poverty and Inclusive Growth

GREATER MAPUTO:

URBAN POVERTY AND INCLUSIVE GROWTH

June 2017

GSU13

AFRICA



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June 2017

Mozambique – Country Management Unit
Africa Urban and Resilience Unit
Global Social, Urban, Rural and Resilience

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List of Acronyms

GMA	Greater Maputo Area
IAF	Inquérito aos Agregados Familiares IAF
INE	Instituto Nacional de Estatísticas
IOF	Inquérito sobre Orçamento Familiar
IPRA	Imposto Predial Autárquico
IASISA	Imposto Autárquico de SISA
MAEFP	Ministério da Administração Estatal e Função Pública
MEF	Ministério de Economia e Finanças
PDE	Programa de Desenvolvimento Espacial
TAE	Taxa por Atividade Económica

Executive Summary

The overall objective of the Maputo Urban Poverty and Inclusive Growth Study is to inform the municipal governments of Maputo and Matola in the Greater Maputo Area (GMA) on how to better target and finance urban poverty reduction programs by building critical knowledge on urban poverty and land-based municipal revenue enhancement. The study carried out an in-depth poverty and vulnerability mapping and analysis in order to better understand the spatial distribution of poverty in the GMA. It showed that poverty has significantly reduced in most of the neighborhoods in GMA from 1997 to 2007. The study also showed a strong correlation between poverty reduction and access to basic services and urban infrastructure, though it was not possible to identify a correlation between poverty incidence of natural hazards based on availability data. The study also carried out for the first time in the GMA a comprehensive housing market assessment in order to collect primary data on real estate market value, which was used as basis for estimating the net present value of different policy options to increase property tax. It suggested that municipal revenue for property taxation could significantly increase if municipalities would improve tax compliance, increase tax rate from actual 0.4 to 1.0 percentage, and use market value to assess property tax. In this case, Maputo City Council would generate Mt 44 billion and Matola Mt 29 billion in NPV terms. Finally, study provided specific policy and institutional development recommendations at national and municipal levels with the ultimate objective to increased urban infrastructure finance, and better target pro-poor interventions not only in GMA, but also benefiting other cities in Mozambique.

I. Introduction

As the prime urban agglomeration in Mozambique, the Greater Maputo Area presents key challenges and opportunities for the country’s goals in promoting inclusive economic growth.

Despite strong economic growth over the past two decades, Mozambique continues to be one of the poorest countries in the world. GDP growth reached an average of 8.4 percent between 1993 and 2013, contributing a reduction in poverty rate from 69.4 percent in 1996 to 54.7 percent in 2009. However, more than half the population is still below poor line, placing Mozambique in the 13th place among the poorest country in the world in 2013. High levels of underemployment and poor human development indicators suggest that economic growth has not been inclusive. While the majority of the population is economically engaged, there are high levels of underemployment as most people live from subsistence agriculture and informal urban activities. In fact, when one considers unpaid family workers as unemployed, the unemployment rates jump to almost 40 percent in 2009. Human development levels are also low, as indicated by Mozambique ranking 178 out of 187 countries in the UN’s Human Development Index. Moreover, progress has been geographically uneven, with the poorest concentrated in the rural areas and in the Central and Northern regions.

Cities are performing better than rural areas in terms of poverty reduction. Indeed, poverty levels declined faster in urban areas than rural areas. Between 1996/7 and 2008/9, poverty declined by 24 percentage points in urban areas, compared to 10 percentage points in rural areas¹. As in most other countries, urbanization and economic growth seem to go hand in hand. However, urban poverty remains high at 49 percent.

Most of the urban growth has happened in the Greater Maputo Area. With about 32 percent of the total urban population, the Greater Maputo Area (GMA) is Mozambique’s largest urban agglomeration. GMA reached 1.7 million inhabitants in 2007, distributed in two municipalities: Municipal Councils of Maputo (1.09 million inhabitants), and Matola Municipal Council (675 thousand inhabitants). The municipality of Maputo houses most of the population of the GMA. But Matola is growing four times faster than Maputo and is quickly becoming a dormitory city for the new urban poor, and the middle class that increasingly cannot afford to live in good locations close to Maputo city center (see table 1).

Table 1. Urban system of cities

City size	1997		2007		Average growth 1997-2007
	Pop	%	Pop	%	
GMA	1,396,700	34.5	1,716,632	32.0	2.1
<i>Maputo</i>	966,000	23.8	1,068,607	19.9	1.0
<i>Matola</i>	430,700	10.6	648,025	12.1	4.2
Intermediate Cities	1,840,348	45.4	2,350,395	43.8	2.5
Small	815,226	20.1	1,294,792	24.1	4.7
Total	4,052,274	100.0	5,361,819	100.0	2.8

Source: INE Census 1997 and 2007. Note: Small intermediate cities have population between 500 thousand and 1 million. Small cities are municipalities with less than 500 thousand inhabitant. The smallest municipality hosted 12,564 inhabitants in 2007.

Most of the population in the Greater Maputo Area live in underserved neighborhoods.

These areas have only basic infrastructure, roads are not paved, sanitation network has not reached, drainage systems are inexistent, and most houses are built with nondurable material. Incidence of airborne diseases such as diarrhea and malaria are more common in underserved neighborhood due to recurrent flooding and poor sanitation conditions. Most people in these areas work in the informal economy, and those that have a job end up spending two to three hours to commute to the center of Maputo where most formal jobs are located. Therefore, full urbanization of these areas can significantly improve the lives millions living in these informal neighbourhoods of Greater Maputo, reducing their vulnerability to commonly preventable diseases and to the exposure to natural hazards that often destroy their income and assets, and increasing access to economic opportunities. However, improving urban infrastructure and services requires both finance to extend the coverage and quality of urban services and infrastructure to the whole GMA, as well as good targeting of urban reduction interventions.

Taking this into consideration, this study aims at mapping and analyzing urban poverty in GMA while unveiling the potential to increase urban infrastructure finance through land-based revenue instruments.

Using available population census and household welfare surveys, the study mapped out the incidence of poverty in GMA in order to better understand the spatial distribution of poverty, its trends, and its correlation with availability of infrastructure, access to basic services, quality of housing, as well as the incidence of natural hazards. In addition, the study undertook primary data collection on the value of land and housing in GMA in order to estimate the potential of increasing property tax through different policy and institutional reforms. Analyzing both urban poverty and the potential for land-based infrastructure finance, this study will help Maputo and Matola municipalities to better target and finance urban poverty reduction programs and interventions. The study will be also relevant to the ongoing decentralization and national urban policy debate² led by the Ministry of State Administration and Public Function (MAEFP) and the Ministry of Economy and Finance (MEF) by highlighting the importance of land-based finance in contributing to national goals to accelerate poverty reduction and economic growth.

II. Putting the Urban Poor on the Map

Poverty Mapping Methodology

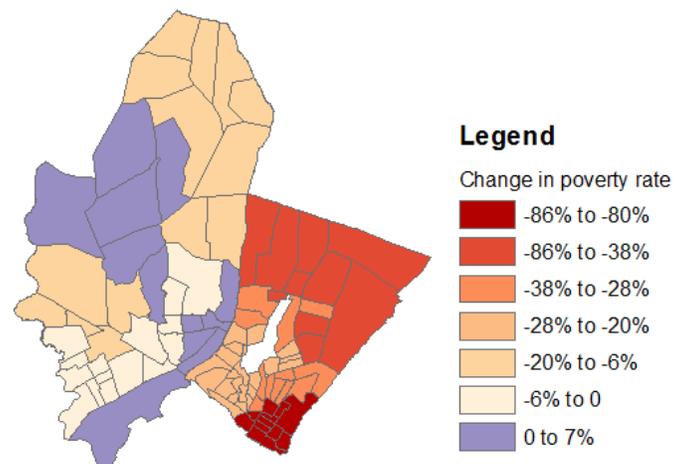
In order to understand the spatial patterns and the trends of poverty over time within the Greater Maputo Area, two poverty-mapping exercises were produced with the most recent statistics date available. This study created two poverty maps using most recent available data including the household welfare surveys of 1996/97 (Inquérito aos Agregados Familiares IAF), and 2008/09 (Inquérito sobre Orçamento Familiar - IOF), and the national population census of 1997 and 2007. The poverty maps follow Elbers, Lanjouw & Lanjouw (2003) methodology that combines household's welfare data with census population data that is more desegregated in order to create a measurement of poverty at the smallest geographic level that have statistic relevance. While household survey data is often richer as it collects information on a wide range of variables, the data is obtained from interviews of a sample of the population, which limits its statistical representativeness, for instance of poverty rates, at high levels of disaggregation. In contrast, census data includes all the households but due to its large geographic coverage, it gathers a more limited amount of information. In a nutshell, the household survey data is used to estimate the parameters of a set of explanatory variables (also available in the census) used to model household consumption for the area under study (country, province, etc.). These estimates are used to impute consumption in the census and thus poverty indicators at geographic units. Because the last population census was carried out in 2007, it was not possible to produce a more up-to-data map of poverty in GMA³.

In order to achieve reasonable precision in the estimates through the small area estimation methodology, geographic units must be large enough - minimum of 10.000 households. If units are too small, confidence intervals may be too wide, producing not very informative poverty estimates. In the construction of such geographic units, three basic criteria were established: i) geographic adjacency, ii) a minimum of 10 thousand households in each unit according to the 2007 Mozambican national census and iii) all *bairros* should be grouped within the same urban administrative division⁴. These criteria are important for reaching more homogenous geographic units and, more importantly, for creating units which respect the existing urban district, administrative *postos* and *bairro* boundaries. Maputo municipality is divided into 7 districts: five contiguous and two isolated⁵. Since the two isolated units together account for approximately 5,000 households and it is not possible to contiguously combine them, they are each used as a single unit. Using the five contiguous districts, there are 55 *bairros*, which are combined into 17 geographic units. Matola municipality encompasses three administrative *postos* in which there are 41 *bairros* grouped into 11 geographic units.

Poverty Headcount Mapping

The Greater Maputo Area has been one of the drivers of poverty reduction in Mozambique. The results of the poverty mapping exercises show that while national poverty levels have seen a modest decline and geographically uneven poverty reduction in spite of strong economic growth,⁶ poverty has reduced faster in the GMA. Maputo Municipality reduced poverty from 37 percent to 10 percent between 1996/7 and 2008/9. The poverty maps produced in this study (figure 1) show that all geographic units within Maputo Municipality reduced poverty between 1997 and 2007. In Matola, half of its geographic units managed to reduce poverty, though at a more modest rate than in Maputo Municipality.

Figure 1: Changes in poverty headcount in Maputo and Matola municipalities (1997-2007)



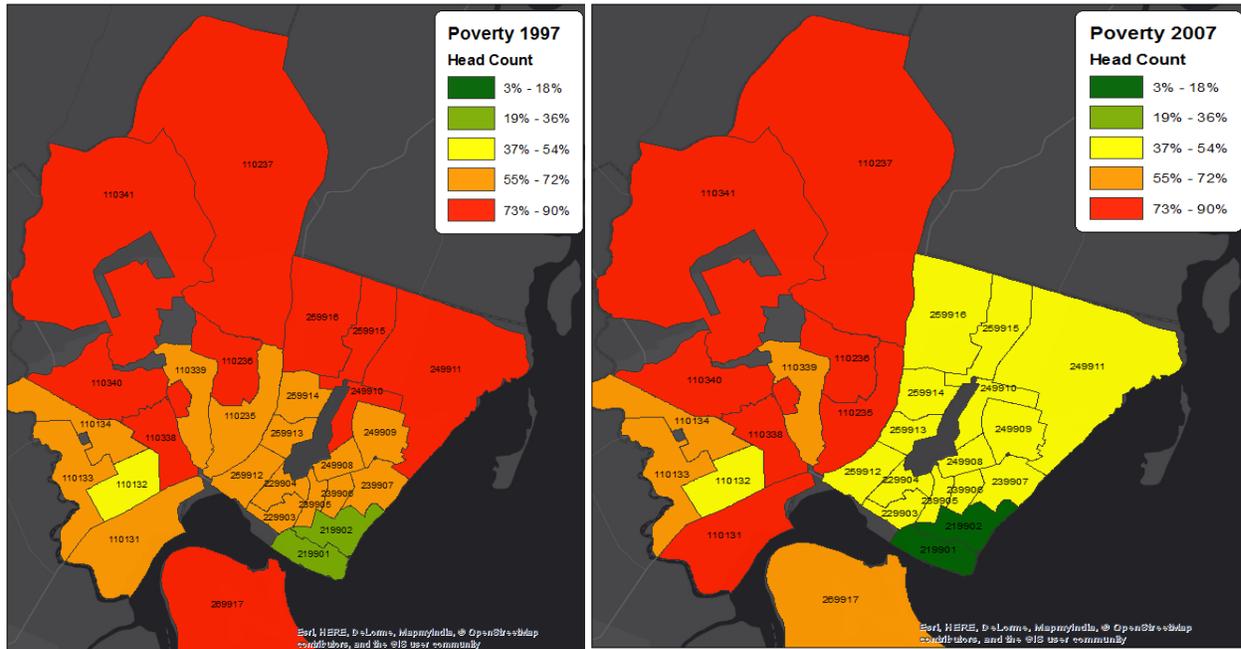
Source: INE IAF 1996/7, IOF 2008/9, Population Census 1997 and 2007

Poverty reduction is not uniform in the GMA. Analyzing the spatial distribution of poverty, it is evident that prevalence of poverty is higher in Matola for both years considered, although the difference in poverty incidence between Maputo and Matola becomes much higher in 2007 (figure 2). This is due to the fact that the poverty numbers in Matola did not change much over time, while Maputo experienced a sharp reduction in poverty in all units between 1997 and 2007. Although exhibiting overall lower poverty than Matola, Maputo also shows in both years a high prevalence of poverty, with the exception of two units⁷, which already in 1997 exhibited relatively low poverty rates and registered in 2007 rates as low as 3 and 5% in poverty headcount. These units comprise the higher income Maputo neighborhoods of Polana Cimento and Sommersfield, as well as the neighborhoods Central, Alto Mae, Coop and Malhangalene.

Maputo Municipality has outperformance Matola in terms of poverty reduction. The analysis shows that in fact all 17 geographic units in Maputo reduced poverty between 1997 and 2007, while the results in Matola are less positive since only nearly half of its geographic units managed to reduce poverty, and at a much more modest rate than the geographic units defined for Maputo. All the five geographic units that registered an increase in terms of poverty headcount are located in Matola, including one that recorded an increase in the poverty headcount of 5%. When looking at the point estimates, the results show a decline in poverty rates in 23 out of the 28 geographic

areas between 1997 and 2007, with 14 of those 23 areas registering a decline greater than 15 p.p. These 14 areas are all located in Maputo, out of which 4 particularly stand out by having reduced poverty by more than 27 p.p. These four areas that displayed these extraordinary results in Maputo include the neighborhoods of Zimpeto, Magoanine, Malhazine, Mahotas, Costal do Sol, Albasine, Ferroviario and Laulane.

Figure 2: Poverty headcount, Maputo City and Matola (1997-2007)

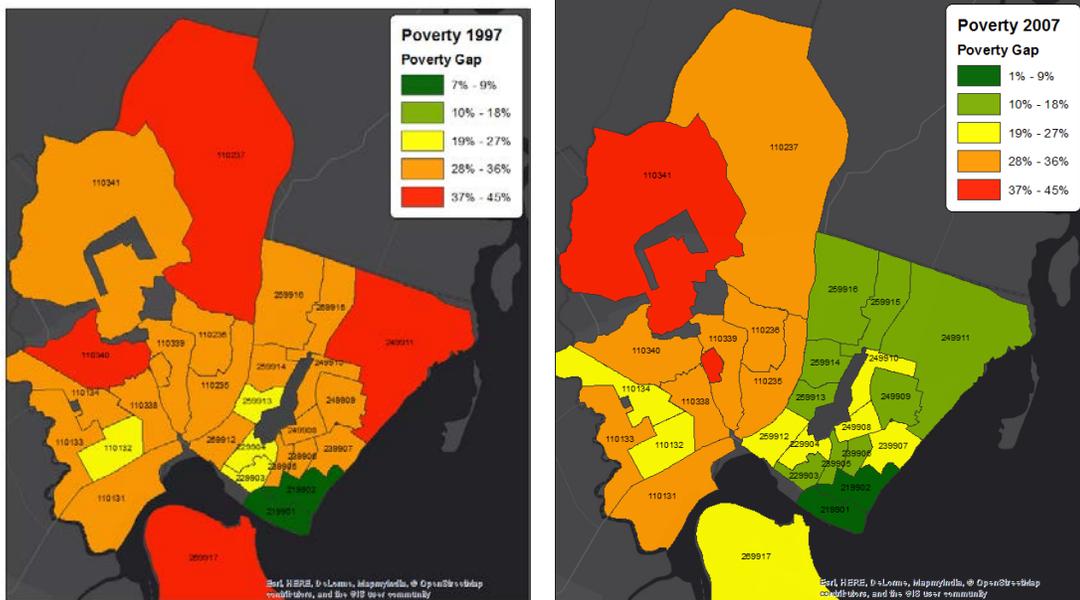


Source: INE IAF 1996/7, IOF 2008/9, Population Census 1997 and 2007

Poverty Intensity and Gap Analyses

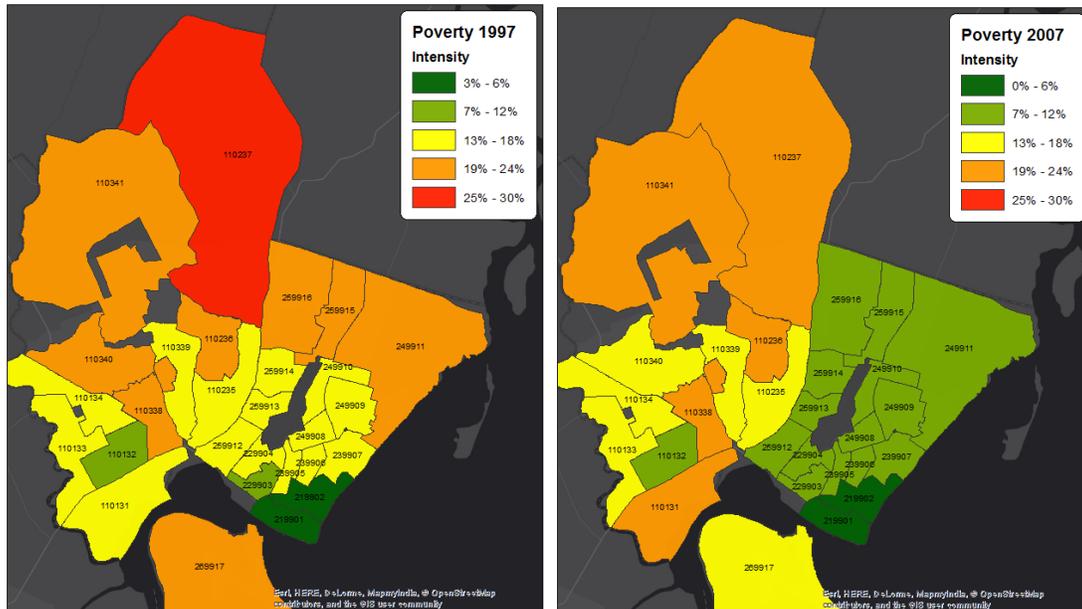
Poverty intensity has also decreased in most of the Greater Maputo Area. To measure intensity of poverty, two indicators were used. One is the *poverty gap* (figure 3), which estimates the depth of poverty as measured by how far, on average, the poor are from the poverty line. The second is the *poverty severity gap* (figure 4), which measures inequality within the poor, and gives higher weights to the poor the farther away from the poverty line they are. In 20 of the 28 geographic units, the intensity of poverty decreased. Among the 8 geographic units that saw an increase in poverty, the highest increase was 4 percent in the poverty gap and 3 percent in poverty severity.⁸ Both the poverty gap and poverty severity indices are better measures than the headcount ratio, because they measure depth of poverty and inequality within the poor instead of simply counting the number of people below the poverty line and considering them equally poor.

Figure 3: Poverty Gap Results for Maputo City and Matola (1997-2007)



Source: INE IAF 1996/7, IOF 2008/9, Population Census 1997 and 2007

Figure 4: Poverty Intensity Results for Maputo City and Matola (1997-2007)



Source: INE IAF 1996/7, IOF 2008/9, Population Census 1997 and 2007

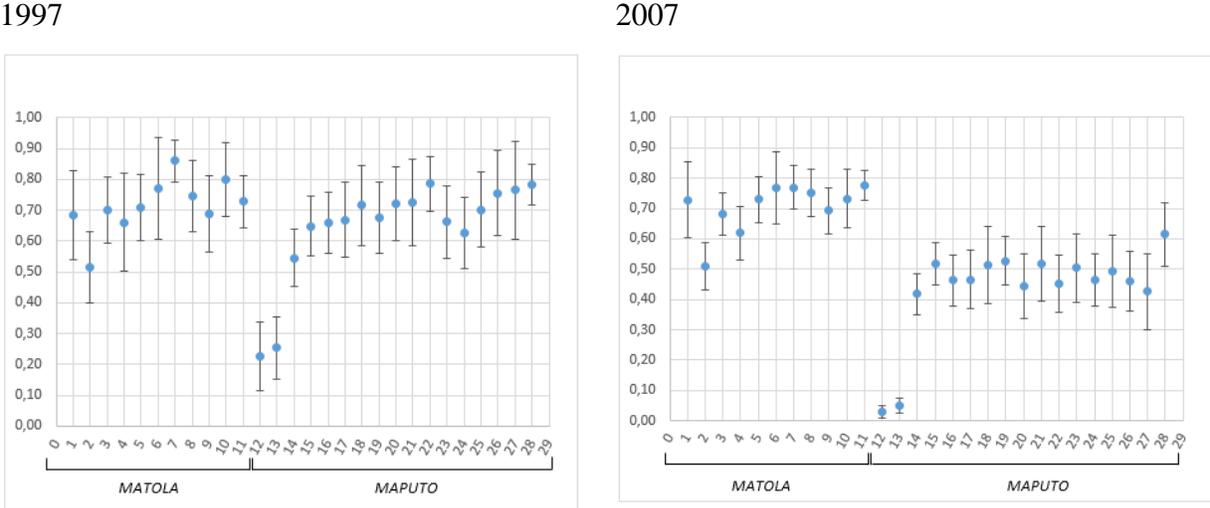
The spatial patterns of poverty in the Greater Maputo Area show that poverty rates are higher the farther people are from the central business district. While the nationalization of land gave the opportunity to many poor families to build the houses close to city center, since then market forces have pushed the poor to outer areas and brought better-off households to move in.

Poverty rates used to be much higher in the neighborhoods immediately surrounding the city center located in Maputo Municipality. But as the poor households sold their properties and moved to outer areas looking for affordable housing, particularly in Matola, poverty rates decreased closer to Maputo central district and increased in some *bairros* of Matola. Rural-urban migration also concentrated in outer areas where land is much more affordable. Between 1997 and 2007, the number of nonpoor households increased in every distance range, whereas the number of poor households increased mainly in the areas beyond 10 km from the CBD.

Robustness analysis

The above comparisons have to be interpreted with caution. Since the IAF and IOF surveys are representative of the Maputo City Province, it is possible to estimate the poverty rates for this geographic level with the survey dataset. Using the poverty mapping procedure, we can also estimate poverty rates with the census data and compare them with the survey outputs as a robustness check. Such analysis was carried out for both the 1997 and 2007 exercises using the poverty headcount and poverty gap for the comparisons with 95 percent confidence intervals. The results show also that, since the confidence intervals for survey and census calculations intersect, it is not possible to reject the hypothesis that these estimations are not statistically distinguishable from each other. It is also important to take into consideration that, given that the poverty rates were imputed on fairly small geographic units (around 10,000 households), the standard errors and the confidence intervals are relatively large. Therefore, even if the estimated points indicate a decrease in the headcount ratios, the actual variation of the poverty numbers depend on a more careful analysis of the confidence intervals.

Figure 5: Headcount results for Maputo City and Matola with 95 percent confidence intervals

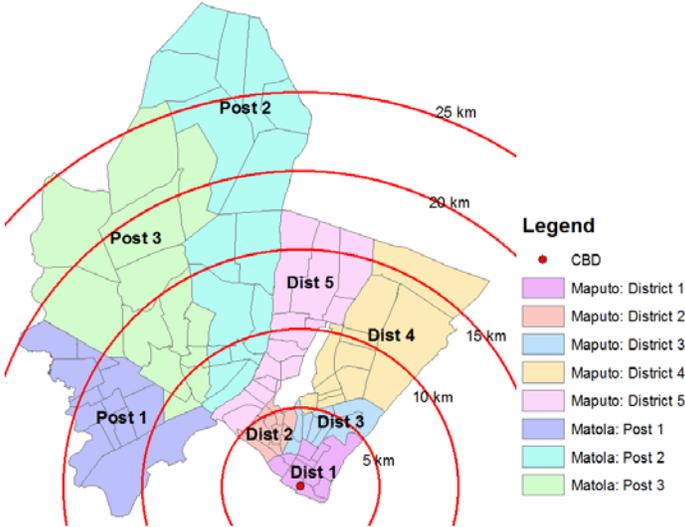


Source: INE IAF 1996/7, IOF 2008/9, Population Census 1997 and 2007

III. Access to Basic Urban Services

The study analyzed the correlation of poverty with the availability of urban infrastructure, access to basic services, and incidence of natural hazards in GMA. Building upon the poverty mapping, the analysis focused on 96 neighborhoods (or *bairros* in Portuguese) in the five administrative districts of the Maputo Municipal Council, and in the three administrative posts in Matola Municipal Council (Figure 6). Most residents of Greater Maputo Area live in *bairros* within 25 kilometers from the central business district (CBD), which for the purpose of the analysis are defined as the bairro *Central C*, and it is located in District 1. A key variable underpinning the spatial analysis is the Euclidian distance between the centroid of each bairro and that of Central C.

Figure 6. Districts and distance from the CBD



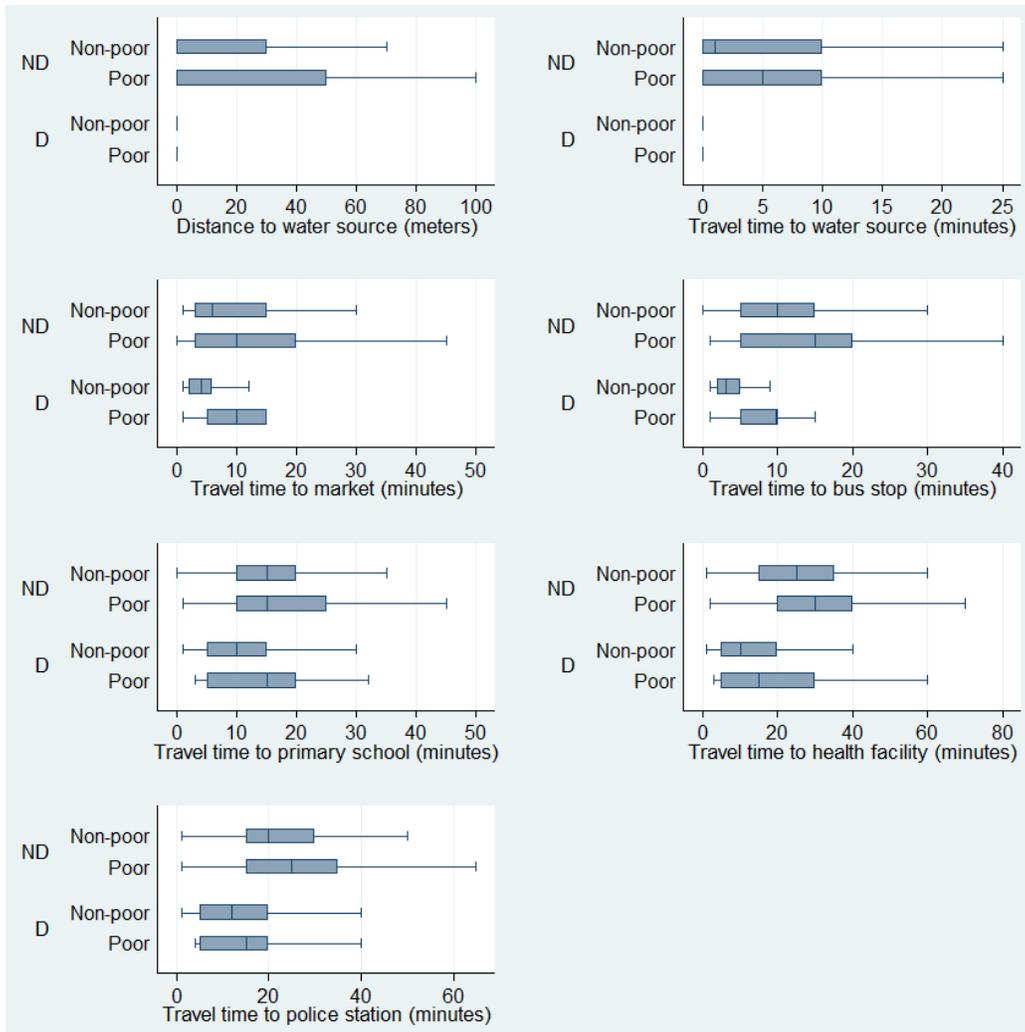
Source: authors

Location and Density Matter

Residents living in informality face greater challenges in accessing basic urban infrastructure and services. Indeed, the distance or travel time to various basic services differs depending on poverty status (poor or nonpoor) and housing materials (durable or nondurable) in 2008/9 (Figure 7). Among the poor, mean values of distance or travel time to most amenities are higher for households in nondurable housing than in durable housing. For instance, compared with poor households in durable housing, poor households in nondurable housing spend about 7 more minutes to get to a water source; 8 more minutes to get to the nearest bus stop; 10 more minutes to get to the nearest health facility; and 11 more minutes to the nearest police station. Similarly, among nonpoor households, those in durable housing enjoy greater access than other households

in nondurable housing. Among households in nondurable housing, poor households spend more time accessing amenities than nonpoor households.

Figure 7. Access to amenities by poverty and housing status in the GMA (2008/9)



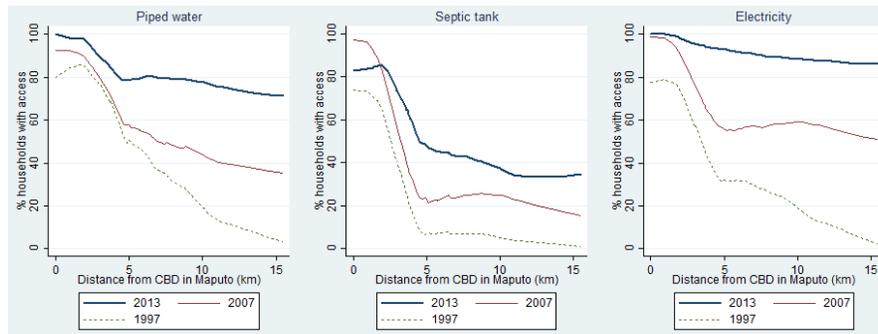
Source: Authors' calculations based on the INE IOF 2008/9

Note: ND refers to nondurable housing, D to durable housing.

Although access to key urban services improved in recent years, there is a major gap in access for those living in outer areas. As illustrated in Figure 8, access to piped water and electricity improved considerably from 1997 to 2013. However, access to sanitation – particularly a septic tank connection – has only improved marginally. Across all these services, there are significant disparities in access based on distance from the central business district. Maputo is divided into five districts, with the central business district located in district 1. Access to piped water inside housing is limited mainly to district 1. Outside district 1, only 10 percent (or less) of households have access to piped water inside their dwelling. A majority of residents instead rely on water for drinking either from piped water outside housing or standpipes, private or public. Residents of Matola also have very limited access to piped water inside their housing, though those

who live within 15 km of the CBD in Matola have better access to piped water outside the home than Maputo residents. As distance to the CBD increases, the main use of a sanitation facility changes from toilets connected to a septic tank to unimproved facilities.⁹ For electricity, virtually no one had access in Matola beyond 20 km (at least in 2007).¹⁰

Figure 8. Changes in access to infrastructure in Maputo by distance, 1997, 2007, and 2013

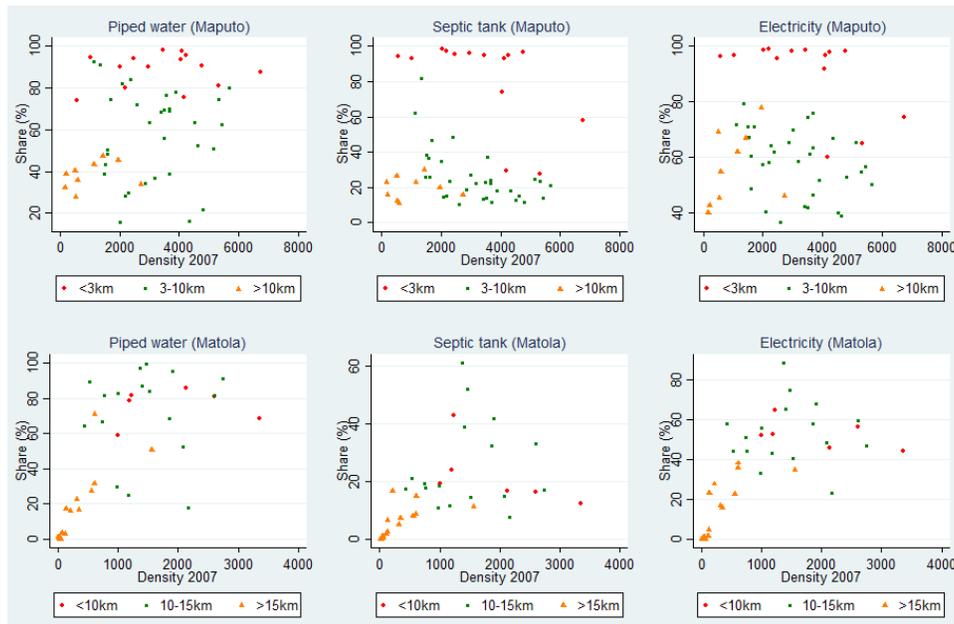


Source: Authors' calculations based on the 1997 and 2007 censuses, and World Bank/WSP Household Survey 2013¹¹.

Note: Distance is measured from *bairro* Central C in district 1. Smooth lines are based on a locally weighted regression.

Moreover, residents living in more consolidated areas tend to enjoy better access to infrastructure. As shown in figure 9, the *bairros* in Maputo within 3 km of the CBD enjoy high access rates regardless of density. *Bairros* more than 10 km away tend to have low density and a lower share of households with access to piped water and other services. The other *bairros* (3–10 km from the CBD) show no clear pattern between density and infrastructure access. By contrast, density seems to be positively correlated with the share of households with access to infrastructure. Higher density could be correlated with better access to services because it may be physically easier and less expensive for government to provide infrastructure and services to residents in more consolidated places than in sparsely inhabited areas. People could also move to areas with better access to services, which can make the area even denser.

Figure 9. Density and infrastructure access in the GMA, 2007



Source: Authors' calculations based on the 2007 census
 Note: Distance is measured from *bairro* Central C in district 1.

Correlation between Poverty and Access

More importantly, there is a positive correlation between access to basic services and poverty reduction. Results from a series of regression models based on *bairros* in 1997 and 2007 point to the link between improvements in infrastructure access and the reduction in poverty rates across *bairros*.¹² A 10 percentage-point increase in the share of households with access to piped water was associated with a 2.7 percentage point reduction in poverty rates; standpipes, 3.5 points; septic tanks, 5.9 points; improved toilets, 6.0 points; and electricity, 7.3 points. In addition, a change in density was also positively correlated with changes in the share of households with infrastructure access.¹³

However, access to infrastructure services does not alone explain poverty. Distance from the central business district and density are also important considerations. For every level of access to services, there are multiple levels of poverty, except for the central business district, where poverty is very low and access to services is very high. A more complete picture to correlate poverty with access to services should include location and density. A series of regression models looked at the extent to which poverty rates are explained by access to infrastructure services and density, controlling for location, by including *bairro* fixed effects, with a constant for each *bairro* to help segregate variance by location. Three services – access to a septic tank, improved toilets, and electricity – observe significant correlations controlling for density in a nonlinear form. Low access to services provision is correlated with high poverty in periurban areas that are farther away from the central business district. But after controlling for distance and density, services are significantly correlated with poverty.

Table 2. Poverty rates explained by access to infrastructure services and density, controlling for location

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Household density	22.27** (8.321)	16.95** (7.374)	19.74** (7.380)	10.51 (8.277)	18.82*** (6.660)	14.36** (6.749)	23.06*** (6.151)
Density squared	-3.786* (1.998)	-2.557 (1.731)	-3.389* (1.764)	-1.287 (1.881)	1.161 (1.751)	1.220 (1.662)	-2.588* (1.428)
Piped water (%)	-0.440** (0.182)		-0.267 (0.172)				
Standpipes (%)		-0.426*** (0.123)	-0.354** (0.128)				
Septic tank (%)				-1.012*** (0.359)		-0.587* (0.312)	
Improved toilets (%)					-0.712*** (0.159)	-0.598*** (0.163)	
Electricity access (%)							-0.730*** (0.137)
Bairro FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.703	0.756	0.780	0.724	0.801	0.829	0.834
Obs.	54	54	54	54	54	54	54

Source: Authors' calculations based on the 2007 census.

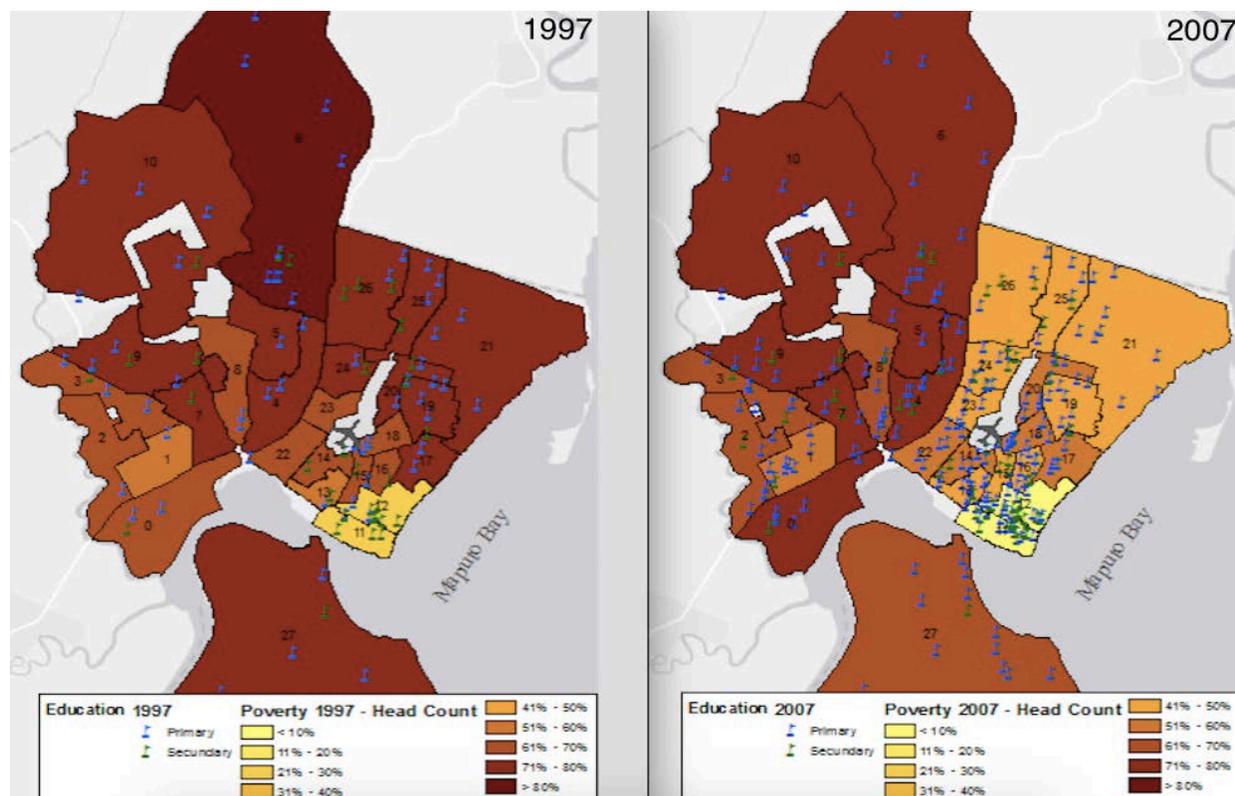
Note: Dependent variables are poverty rates (%). Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Constant terms are not shown.

While poor areas in Maputo and Matola benefited from greater access to primary school facilities, progress has been slow for secondary schools. Primary school facilities expanded from 1997 to 2007 in areas with high poverty rates. Data from the World Inequality Database on Education (WIDE) indicate that in the GMA, 27 percent of children of primary school age did not attend school in 1997, but only 3 percent in 2007/08.¹⁴ Figure 10 confirms this general trend and shows that areas underserved in 1997—in particular the *bairros* George Dimitrov (24), Inhagoia, Bagamoyo (23), Hulene (18, 20), Chamanculo (13, 14), Luis Cabral and Jardim (22)—saw a greater number of primary school facilities.¹⁵ At secondary level, however, education infrastructure expanded on a much smaller scale. While Maputo and Matola cities benefited from an overall upgrading of secondary school facilities, some high-poverty areas remain almost unchanged. These include the western *bairros* of Tsalala, Mahlampswen, Ndlavela (9, 10); and northern *bairros* of Matola such as Mukatine, Mali, Muhalaze (6); but also the eastern *bairros* of Maputo such as Davide, Albazine (25), Triunfo, and Costa do Sol area (21) as well as Katembe area (27).

More worrisome, education outcomes continue to be low for the urban poor. Graduation rates stayed low through 2007/08—62 percent from primary school and a mere 10 percent from secondary school.¹⁶ Both maps confirm—within the areas with high poverty counts—the

correlation between the poor children and those the farthest from primary and secondary facilities. The cost of school supplies is another burden for poor families, nationally.¹⁷ Around 29 percent of the country’s poorest children cannot read or write, and are almost ten times more likely not to set foot in a classroom than rich children (3 percent).¹⁸ On gaps in mean school years, young Mozambicans in the GMA ages 20–24 spent 4.3 years in formal education in 1997 but 6.1 years in 2008. Being poor exacerbates inequalities, with the poorest children spending less than 2.33 years in school.

Figure 10. Locations of educational facilities and poverty rates



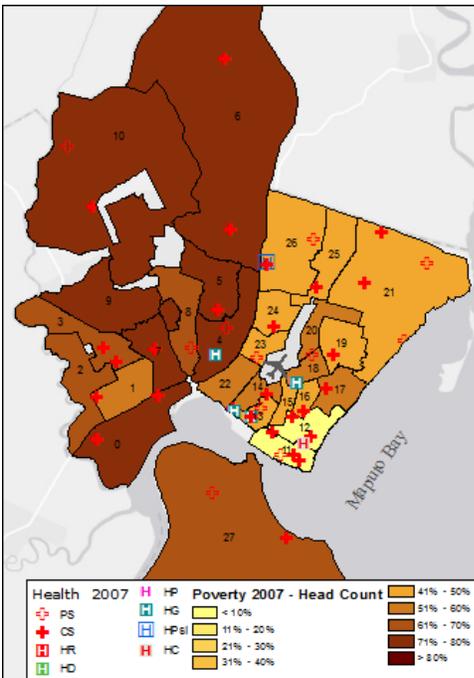
Source: World Bank poverty maps with overlay of primary and secondary education georeferenced data from the Programa de Desenvolvimento Espacial (PDE)¹⁹.

Note: The figure shows an overlay of the 1997 and 2007 poverty headcount ratio, with private and public education facilities for primary (blue) and secondary (green) education.

Access to health services remains inadequate, particularly for the poor, as they need to travel long distances to reach the nearest health facility. No georeferenced data on health care facilities could be found for 1997, so figure 11 shows data from 2007. In areas of high poverty in Matola—particularly western *bairros* such as Tsalala, Mahlampswen, Ndlavela (9, 10); northern *bairros* of Matola like Mukatine, Mali, Muhalaze (6), and Matola city *bairros* including Matola A-J and Trevo (0, 1)—distance to the nearest health facility is a common problem, and the poorest are less likely than the rich to seek medical attention. 20 *bairros* (21 percent) have no health facility within 2 km of the center; 37 *bairros* (39 percent) have only one health facility; and 19 *bairros* (20 percent) have two. The number of poor households with no access to a health facility within 2

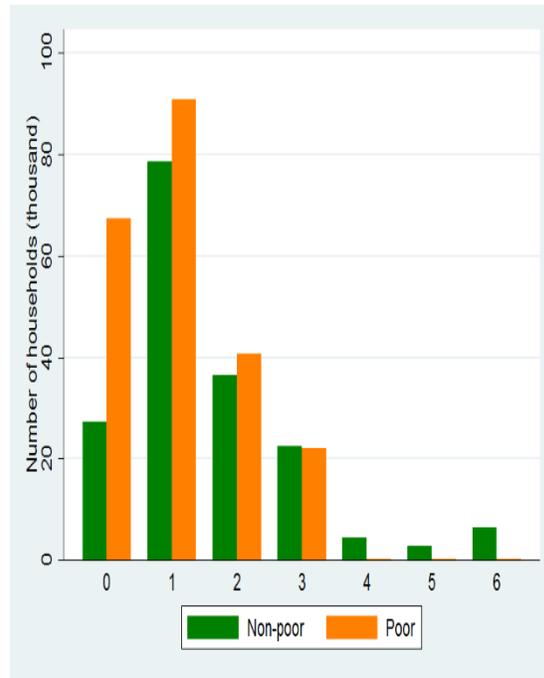
km is three times as high as for nonpoor households (figure 12). This may explain why traditional medicine is still commonplace at the *bairro* level. A Government report of 2012 estimates that more than 70 percent of Mozambicans rely on it; for many, it is the only health service available (with a ratio of 1 healer to 200 people).²⁰ In 2007, Mozambique had a density of just 0.0026 medical doctors (physicians) per 1,000 people and is classified as one of the countries with a critical shortage of human resources for health.²¹ The *World Health Report* ranked Mozambique's overall health system performance in 1997 as 184 of 191 countries.²²

Figure 11. Health facilities and poverty rates (2007)



Source: World Bank Poverty Maps with overlay of health facilities georeferenced data from the Programa de Desenvolvimento Espacial (PDE).

Figure 12. Households per health facility within 2 km (2007)



Source: Authors' calculation based on the 2007 census and Programa de Desenvolvimento Espacial.

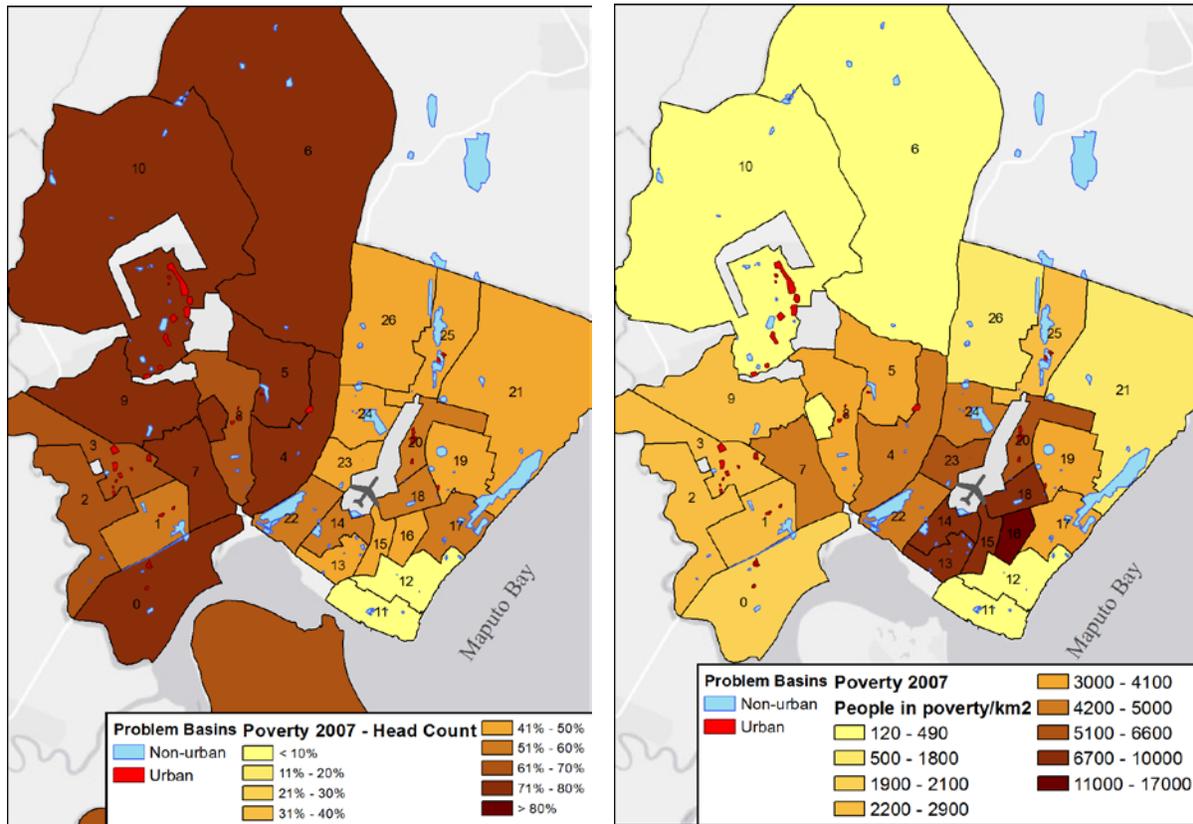
Note: The height of a bar indicates the number of households. X-axis indicates the number of health facilities within 2 km from the center of each *bairro*.

Exposure to Natural Risks

Access to basic infrastructure such as paving and drainage in underserved informal settlements is also likely to further increase the exposure to floods in the Greater Maputo Area. Although the GMA is prone to recurrent flooding and erosion, existing data²³ do not indicate that the poor are disproportionately more affected by it. Figure 13 shows that no significant correlations were found between level of poverty and share of area exposed to flooding. While it was not possible to correlate the current incidence of flooding with poverty levels, the continuous informal urbanization of peri-urban areas will likely increase the exposure of the urban poor to

flooding and erosion. As discussed, most of the urban infrastructure network is concentrated in the core areas (*cidade cimento*), while the informal settlements that continue to grow in peri-urban areas lack the most basic infrastructure such as paving and drainage. Moreover, the peri-urban areas are mostly flat which makes particularly difficult for rainwater to dissipate.

Figure 13. Flood-prone areas and poverty in the Greater Maputo Area (2007)



Source: World Bank map based on data from the 2007 census, and 2008 household survey, combined with the Sanitation and Drainage Master Plan for Greater Maputo/AIAS.

Note: The areas in gray-scale are not covered by the analysis. The analysis combines available data on flood-prone areas with the spatial distribution of poverty. The flood-prone areas identified are scattered across the entire GMA, reflecting both the more homogenous topography and the lack of drainage infrastructure in most neighborhoods.

IV. Access to Affordable Land and Housing

Land and Housing Market Assessment

Housing markets play a very important role for cities, both in terms of access to affordable shelter, and as a revenue potential through land value capture. This chapter drills into secondary and primary data to analyze, for the first time, the land and housing market of the GMA. The objective is to better understand an important real estate market segment not formally recognized by legal nor institutional frameworks. Since land is legally considered as a public asset, it cannot be commercialized nor taxed based on market value. Ultimately, this analysis may set forth policy and institutional reforms which can enhance municipalities' ability to capture urban land value to finance much needed urban infrastructure. Additionally, overlapping housing price data with poverty map may bring light to unofficial housing market and its affordability aspects. These aspects may affect particularly shelter options for the urban poor.

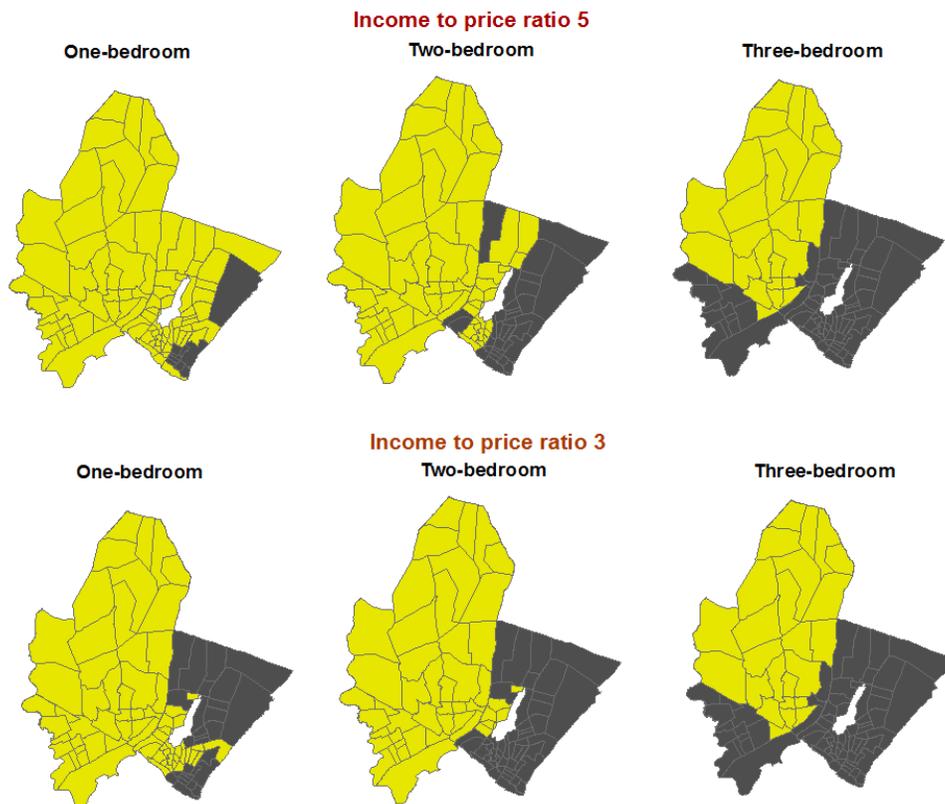
The study collected data on housing market by location and type of construction material in the GMA. Following Dowall's land value assessment methodology (Dowall 1991), the team conducted interviews with local formal and informal real estate brokers knowledge of real estate transactions in the different neighborhood. Through this interviews, it was possible to classified housing prices by different categories: (i) small, medium, or large, (ii) durable and non-durable material homes, and (iii) location. These were the five steps taken to collect and analyze GMA housing data. For each data point, Dowall recommends to gather three interviews. But he also explains that this would create an unnecessary repetition burden turning the whole exercise inviable. Hence the solution is to extrapolate the original sample. One interviewed expert with experience beyond his original area provided information about other areas. That reduced the number of interviews needed for the survey. Another important methodological aspect is the notion that the team needs to gather the median values, not the average. So, instead of adding three answers about the same question and dividing the result by 3, the team has to discard the highest and the lowest and consider only the median value. That way, it is possible to avoid outliers impacting the final value.

Besides primary data collection, the team has also based some of its efforts on secondary data as well. Secondary data sources include: the 2007 population census, and real estate market prices available on 2012 government surveys. These figures help understand market prices evolution through time. Having historical series data boost projections' accuracy for future estimates on real estate prices. Finally, it is important to note that the data was collected during the recent GDP slowdown driven by the end of the commodity super cycle that in the past fueled real estate prices in GMA and concerns with debt sustainability. Anecdotal evidences show that the housing market has cooled down in the GMA, and prices deflated. But since economic growth is expected to bounce back in the coming years, and the constraints in the supply side of the land and housing delivery systems have not been addressed, the findings of these chapter remains valid.

An Increasingly Unaffordable Housing Market

Housing has become increasingly unaffordable in Maputo. Housing, even in informal areas, is particularly unaffordable in good location in Maputo. The housing market in GMA has two submarkets, one for durable housing and one for nondurable housing. Durable dwellings have walls made of either cement or bricks *and* a roof made of either cement or tiles. Durable housing costs between Mt 10,000 and Mt 145,000 per m² while nondurable housing costs between Mt 3,200 to Mt 41,300 per m². At an income-to-price ratio of 3, a large part of the nondurable housing market in Maputo therefore becomes unaffordable, including a one-bedroom unit (see figure 14). At a ratio of 5, one-bedroom unit made of nondurable material is within the reach of households with median income. As a result, an increasing proportion of nonpoor households live in nondurable housing, farther away from the central business district. Assuming that people can afford to buy a house that costs less than three times their annual income—or five times at most—the affordability lines for a median-income family are Mt 309,960 and Mt 516,600, respectively.

Figure 14 Where can a median income family buy nondurable housing?

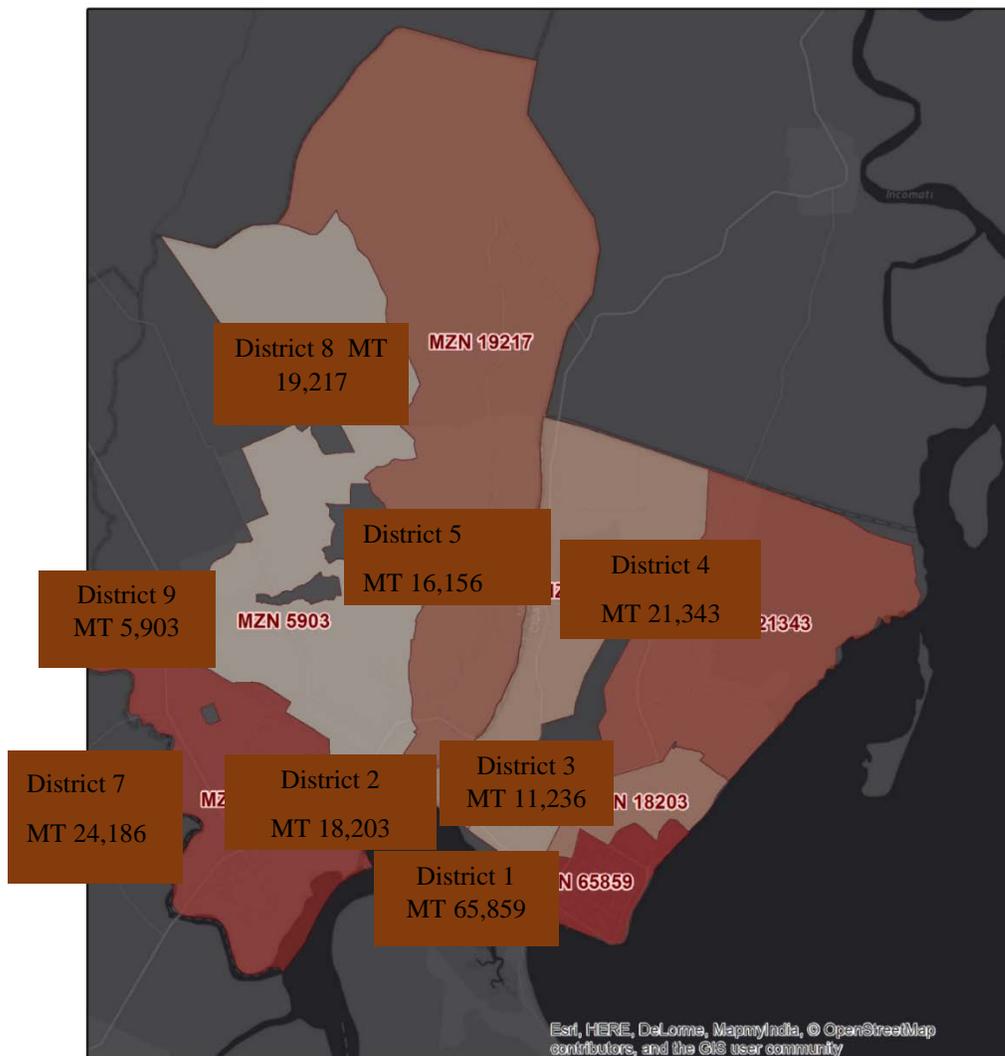


Source: Primary data collection of housing prices 2016

Note: Bairros in yellow indicate where average price of nondurable housing is within five (three) times of median family annual income in the GMA

Distance from the city center is a mayor price driver, but land values are also an important factor. Housing is most expensive in district 1 and 2, but new real estate development is gentrifying district 3 and also increasing home prices while other residents are moving to districts 4 and 5 in search of bigger plots and more affordable housing (see figure 15). The demand for housing is growing in all segments of the market due to overall population growth, smaller family structures, but also larger flows of money into real estate from the main players in the natural resource industry. As supply of land and housing has not accompanied growth in demand due to policy and intuitional bottlenecks, a result, prices have skyrocket in GMA.

Figure 15 Average home value per m² (2016)

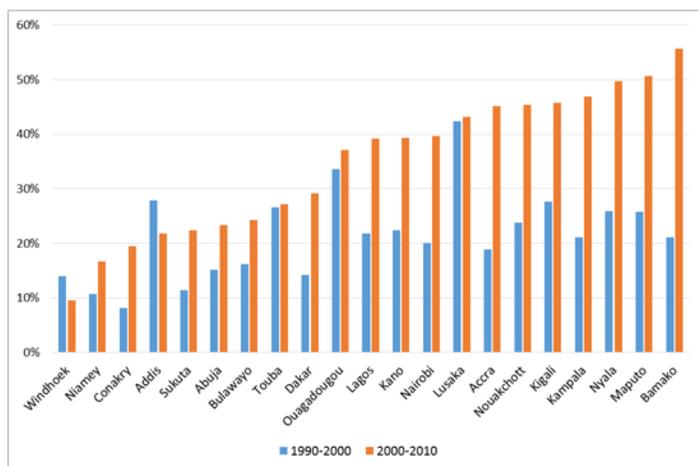


Source: Source: Primary data collection of housing prices 2016

GMA has one of the most inefficient land use in the continent, According to a recent study (Baruch 2015) that used night light data to compare African cities, Maputo has the second highest percentage of leapfrog development. In other words, 50% of new development is taking place in low density areas, disconnected from existing consolidated urban areas (figure 16). There has been

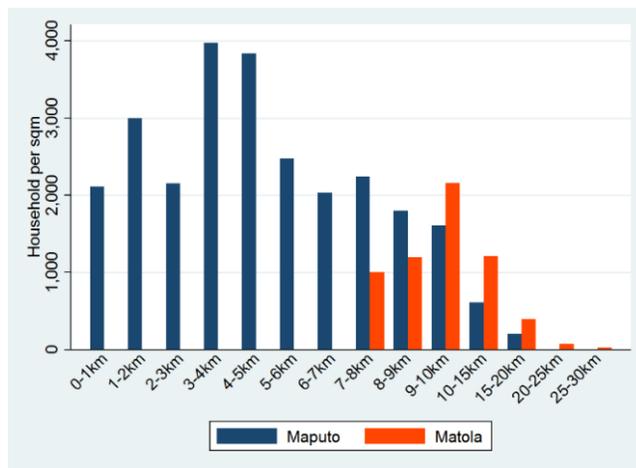
also a sharp acceleration of leapfrog development in the last decade, from 25% during the period of 1990-2000 to 50% in 2000-2010 period. This coincides with the acceleration of urban population growth as well as the boom in the housing market fueled by the commodity super cycle. As a result, the GMA is characterized by “islands” of high density surrounded by a low density urban fabric. Household density declines farther from the CBD, as plot area per house increases with distance. While the CBD has average densities, with up to 4,000 households per km² within 3-4 km, density decreases significantly at 10-15 km from the CBD, until it meets the CBD of Matola (figure 17).

Figure 16 Share of leapfrog development in African cities



Source: Baruah (2015)

Figure 17. Density by distance from the CBD



Source: World Bank staff estimates based on the 2007 census

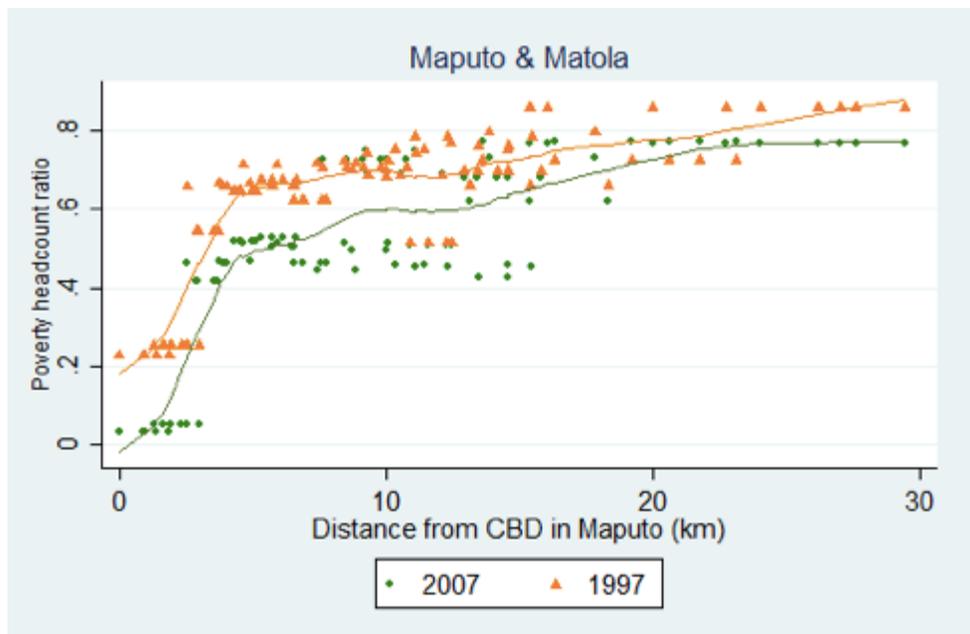
Leapfrog development undermines economies of scale and makes the provision of basic services more difficult and expensive. Several factors underline the problem with inefficient land use in GMA. First, and foremost, land was nationalized after Independence, but since then people have been trading the land without a proper legal and institutional framework that recognize land market forces and ensure transparency and accountability. The current flaws in the land policies created a highly dysfunctional informal land market that inhibit land to be traded more competitively in an open market. Secondly, property tax as the study analyzed is very low, and not charged for vacant land. If property taxes would be higher, and charged if land is kept vacant, this would create pressure to landlords trading land that is not bringing enough economic return or social benefit. Finally, since land was declared a state asset, many well-connected individuals and firms acquire formally or informally vast areas and are keeping idle waiting for prices to go even higher.

Inefficient land use not only contributes to inflate prices artificially, but also increase the cost and complexity in providing urban infrastructure and services. The problem is that lack of an urban agglomeration economy makes it more difficult and expensive to provide basic services later on because those areas are beyond the boundaries of urban infrastructure network and service provision, and cut across very low density areas. Instead of facing marginal costs, investment requirements need to consider more expensive structural expansion costs shared by fewer users in order to provide services to households that are located farther away. Vacant land that is not for

sale reduce the supply of land, and in a city where demand has been growing substantially, this artificially increase the overall price of land. If all the stock of vacant land in GMA would be brought into the market, prices would decrease and equalize based on real supply and demand.

High housing prices are pushing the poor and middle class far from jobs and good infrastructure. As figure 18 shows, household income decreases away from the central business district of Maputo. From 1997 to 2007 this situation only got worse. While it is common to find socioeconomic differences as prices closer to city center is often higher in most cities in the world, it is contradictory that this phenomenon is taking place in GMA where land is public, and legally now for sale. The risk of this informal land market is that few are profiting from their privileged access to information and finance, while the majority of the poor population are subjected to stressed land sales as they do not have enough information to negotiate with buyers.

Figure 18 Poverty rate and distance to the CBD in the GMA, 1997 and 2007



Source: World Bank staff estimates

Note: Distance is measured from *bairro* Central C. Smooth lines are based on a locally weighted regression.

This inefficient land use and dysfunction housing market push the poor and middle-class to the urban fringes, which in turn increase the needs for investing in transport. Currently, it takes up to two hours for the residents to get to the central business district of Maputo, limiting their access to job opportunities and increasing their expenses with transport. Recent road infrastructure development has taken place but the existing road traffic capacity is not meeting the travel demand of daily travelers to CBD. Residential areas are expanding in a fragmented way in the suburbs, leading to increased commuting to the central business district between the East and West axes of the Greater Maputo, and the North and South axes within Maputo (JICA, 2014). This is causing increased levels of traffic congestions at a travel speed of less than 20km/hour during peak hours between homes, jobs and businesses, making commuting slow and costly for the urban poor. While road projects such as the Ring Road Project, a four lane arterial 74 km road, the works

on Avenida Marginal, Maputo's beach road and the Katembe Bridge Project, are aiming to link the districts to Maputo, there is limited arterial roads to complement the national roads and other main roads to the suburbs and districts.

In sum, access to affordable housing is deteriorating rapidly in GMA, weighting both in the pockets of ordinary citizens and local authorities. Since land policies are decided at national level, it is urgent that the Government of Mozambique addresses the flaws in the current land legal and institutional framework which makes land so unaffordable in GMA. At the same time, Maputo and Matola municipalities can use their instruments at their disposal, such as territorial planning, land management, and land-based finance to incentivize a more efficient urban development.

V. Leveraging Land Based Infrastructure Financing

Rapidly growing cities face huge challenges in financing urban infrastructure and services.

As urban areas grow faster than the capacity to finance the requirements in infrastructure and services, local governments face mounting pressure to address both the current urban deficit in underserved areas as well as to lay out the primary networks to keep pace with future growth. This is particularly true in metropolitan areas as in the case of Maputo, which concentrates the largest share of the urban population and urban economy in the country. As such, the two main municipalities, Maputo and Matola, are expected to be less dependent on intergovernmental fiscal transfers, and more fiscally self-sufficient than the smaller municipalities and rural areas.

International experience shows that larger urban agglomeration can leverage land based financing as one of the most important source of urban infrastructure finance. Land based finance instruments are designed to capture both the future increase in real estate from public finance, and the already internalized value of real estate. Property tax is the most common instrument at disposal of municipalities. Other land-based finance instruments include betterment levy, transfer of land use rights. Land value capture financing generate significant resources to finance infrastructure, complementing or as an alternative from borrowing (table 3).

Table 3. Examples of Land Based Finance for Local Governments

<i>Instrument</i>	<i>Objectives</i>
Recurring Land and Building Taxes	<ul style="list-style-type: none"> • Tax is assessed based on the current value of the property and payed regularly (i.e.; annually)
Betterment Charges and Special Assessments	<ul style="list-style-type: none"> • Generally one-time charges for cost-recovery of future public infrastructure investments
Developer Extractions	<ul style="list-style-type: none"> • One time charge for the approval of additional development or issuing of building permits
Land Value Increment Taxes	<ul style="list-style-type: none"> • Allow to capture part of the land value added due to infrastructure improvements or change in land use for often goes beyond cost-recovery
Sale of Development Rights	<ul style="list-style-type: none"> • Government sells or action to developers and investors the right to build more than the limits set by land use regulations
Land Leases and Sale	<ul style="list-style-type: none"> • Government mobilize resources from selling or leasing public land
Transfer Taxes and Stamp Duties	<ul style="list-style-type: none"> • Government captures part of the property value when the title is transfer to another party

Source: Leveraging Land Based Finance for Local Governments: A Reader. UNHabitat 2016.

Unmet Revenue from Land Based Financing

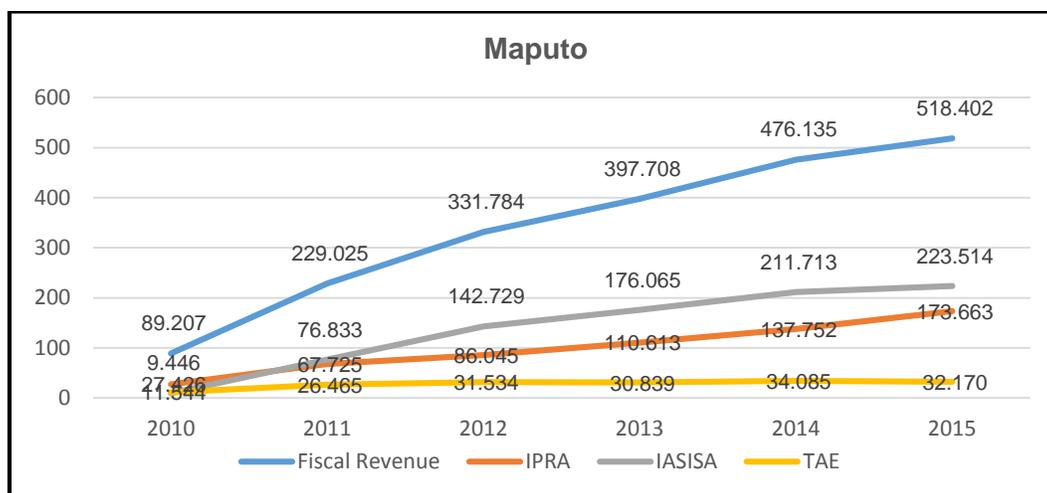
However, municipalities in the Greater Maputo Area are not fully taking advantage of its land based financing instruments. The country's decentralization laws empowered

municipalities with a variety of land based financing instruments, including property tax (IPRA), transfer tax (IASISA), economic activity tax (TAE), which is assessed based on the value of the land (TAE), and betterment levy. But these land based financing instruments are highly underutilized.

Compared to other cities around the world, property tax revenue has a great potential to boost OSR. This study focused primarily on the potential to increase municipal revenue from IPRA due to the importance of property taxation in shoring up municipal finance as seen in many cities around the world. Moreover, betterment levy has yet to be implemented in Mozambique though it is provided by law. IASISA is in place, but most underreport the actual value of sales. According to the Organization for Economic Co-operation and Development (OECD), property taxes are on average responsible for half of local revenues,²⁴ but only recently reached 33.5 percent in Maputo and 15.5 percent in Matola. In 2015, the average IPRA value in Maputo was five times smaller than the IPRA tax levied by cities like Campinas (2015, São Paulo, Brazil), which is US\$446.70²⁵ and Durban (2013, eThekweni, South Africa) which is US\$353.31.²⁶ For Matola, IPRA was fifteen times smaller.

Tax revenues from land based instruments have substantially increased over the past years in Maputo. The Municipal Council of Maputo (CMM) has undertaken a significant effort to modernize its property tax system with the support of the World Bank funded Maputo Municipal Development Project – Phase II (*ProMaputo II*). Under ProMaputo II, land based tax revenues increased from Mt 89 million in 2010 to Mt 518 million in 2015 (figure 14). In Matola, tax revenues also grew from 2011 to 2015 but from a lower base (figure 15). Tax revenues increased from Mt 22 million in 2011 to Mt 100 million in 2015 (the equivalent of Mt 104.16 per capita). In 2015, the shares of total tax revenue across the various land value capture instruments were 43 percent in property transaction tax (SISA), 33 percent in property tax (IPRA), and 6 percent for economic activity (TAE).

Figure 19. Growth in tax revenue by main source in Maputo (2010–15)

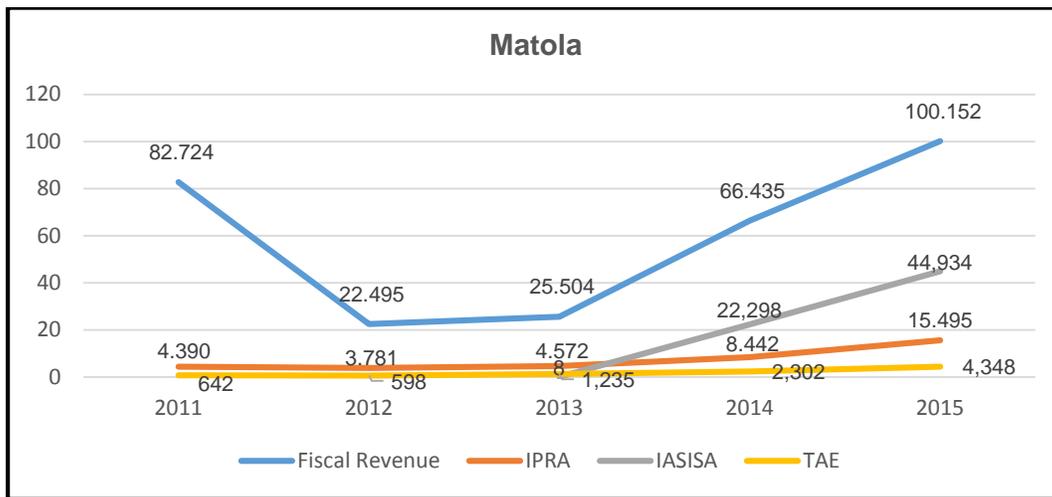


Source: Department of Finance of Maputo Municipal Council (April 2016).

Note: figures in MT thousands

In Matola, tax revenues also grew from 2011 to 2015 but from a lower base. Tax revenues increased from Mt 22 million in 2011 to Mt 100 million in 2015 (the equivalent of Mt 104.16 per capita). The main source of land value capture is SISA, at 45 percent in 2015 (similar to Maputo). However, IPRA accounted for only 15 percent and TAE 4 percent of collections in 2015. As the city of Matola only began collecting SISA in 2013, data relate only to 2014 and 2015. Very low projections in 2014 —the first year of actual tax collection—explain the wide variance with execution.

Figure 20. Growth in tax revenue by main source in Matola (2011–15)



Source: Department of Finance of Matola Municipal Council (May 2016).

Note: figures in MT thousands

However, the average value of IPRA for both municipalities is extremely low, and its growth in recent years does not adequately reflect the rapid urbanization in both cities. In 2015, the average value of IPRA was Mt 4,421 for Maputo and in Mt 1,529 for Matola. The average IPRA value in Maputo is one-fifth the IPRA tax levied by cities like Campinas (2015, São Paulo, Brazil), which is US\$446.70²⁷ and Durban (2013, eThekweni, South Africa) which is US\$353.31.²⁸ Currently neither municipality currently has an index to systematically record increases in property values. The Municipal Commission of Urban Building Assessments (CAAPU), which by law is in charge of assessing real estate values for tax purposes, is required to provide an annual review of basic values for IPRA collection, incorporating real estate valuations made in the current year.²⁹ When this study was conducted, Maputo has its CAAPU already operating, albeit with delays in its assessments. Matola had not approved regulations for establishing a CAAPU.

The number of property units listed in the IPRA cadaster is extremely low. In Maputo, comparing its data with the 200,000 estimated properties by the Administration of the Real Estate Housing Stock of the State (APIE),³⁰ 38 percent (76,616 housing units) were registered, but only 20 percent (39,279) were in the actual collection cadaster in 2015. Matola's data are even patchier, with only 5 percent (10,137 housing units) in its cadaster. Moreover, supervision system for tax administration is fragmented among several departments. There are different inspection teams for each municipal town council and different teams for each public sector responsible for the various

land value capture instruments, including property tax (IPRA), property transaction tax (SISA), economic activity (TAE), and land use right titles (DUAT).

Options for Increasing Land Based Financing

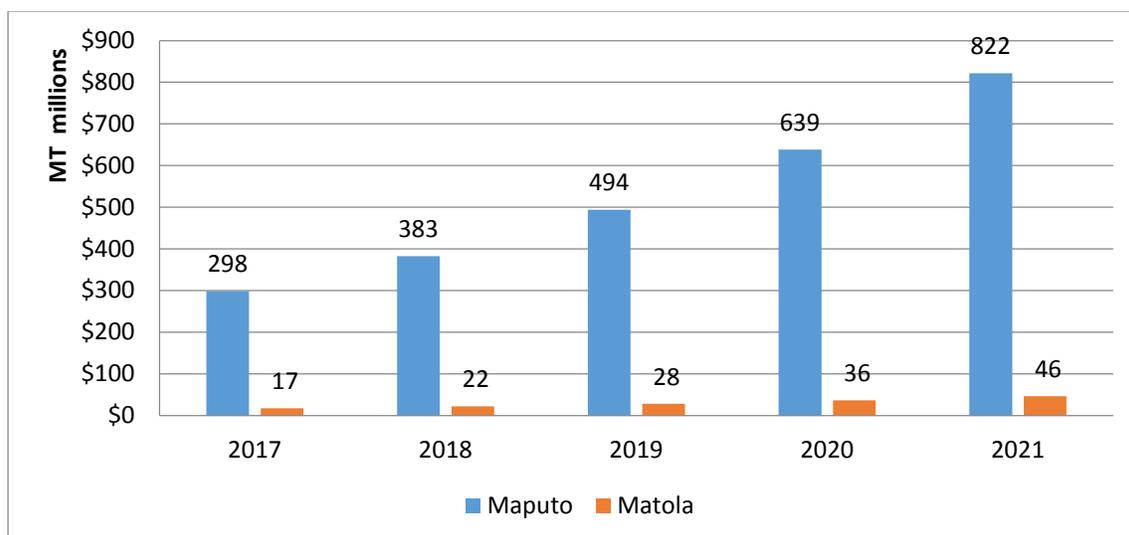
Maputo and Matola municipalities have been increasing their revenue from property tax, but there are alternative policy options that can boost IPRA even further. As such, the first option is continuing with the same directions. That would be the baseline for comparing with alternative options which have the potential to increase revenues even more. After all, IPRA tax revenue is indeed growing. Hence, if no policy change is done, the growth in IPRA revenue will continue at the same rate. The second policy option is to enhance enforcement of IPRA collection. If enforcement is raised to the higher levels as it is currently enforced in District 1, then revenue can raise to the levels explained on that model. The third policy option is to update construction costs based on market value. This model would not require any change in the IPRA formula, but only to move the main factor for assessing property price closer to real market value. The fourth policy option requires revising the IPRA formula to start charging 1% tax rate instead of the actual 0.4%. The fifth policy option would use the market value of real estate assets instead of the current formula which mainly assess the construction costs and disregard the actual market value of the land.

Each policy is valued through the traditional net present value (NPV) valuation method, which estimates the value of each policy decision. The projections take into consideration the attrition rates based on the Maputo City Council report on Polana Caniço Urbanization to ensure that these higher projections are adjusted to forecast the more likely attainable revenue. This attrition rate was estimated by adding the baseline to the tax collection efficiency rate multiplied by the spread between the IPRA potential and the baseline. This is done throughout the years, using IPRA projections. Even accruing for attrition, 2021 collection (orange column) is still expected to reach Mt 1.5 billion versus Mt 0.8 billion for the baseline for that year.

Scenario 1: Business as Usual

The first policy option for Maputo and Matola to continue with the current approaches to IPRA collection the way it has for the past decade. Therefore, this first policy option would not generate any increase in NPV. However, as one can see from the figure 22, there is currently a wide discrepancy between Maputo and Matola in terms of IPRA collection.

Figure 22. Maputo and Matola IPRA baseline revenue forecast (2017–2021)



Source: Maputo and Maputo municipalities. 2015. *Revenue Forecast Report*; author's calculations

Notes: in Mt millions

Scenario 2: Potential IPRA collection with improved enforcement

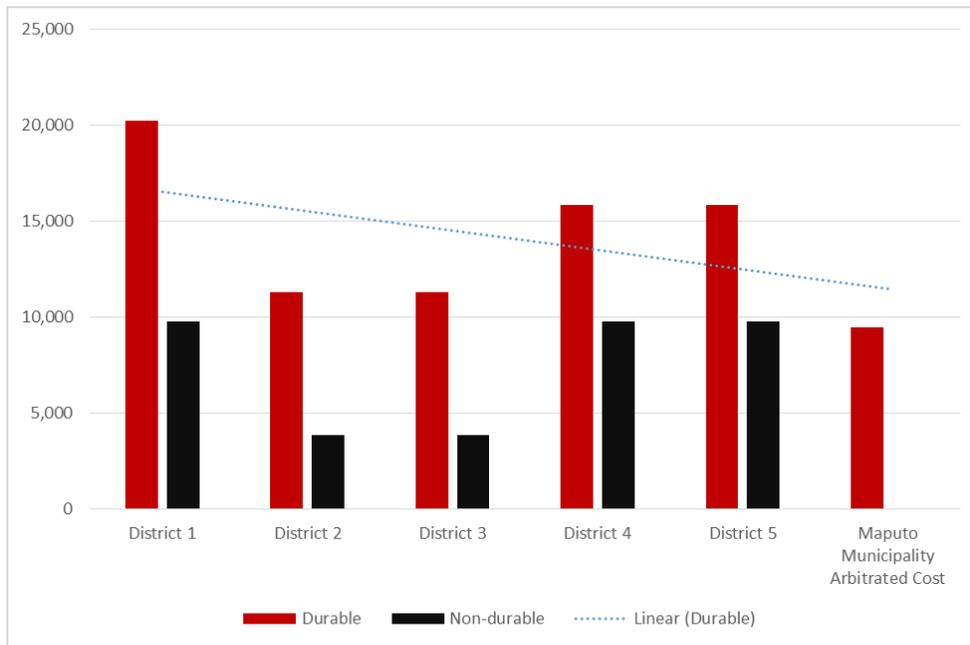
The second policy option is to collect IPRA from all taxable properties in Maputo and Matola. This policy option does not imply legal changes. It only requires better enforcement of tax collection throughout all durable homes. This would require more officials and a better tax registry. Expanding collection enforcement to all durable homes in Maputo, regardless of district, would generate Mt 4 billion in NPV. The same policy option would generate Mt 2 billion for Matola in NPV.

Scenario 3: Potential IPRA collection using market based value of construction material

The third policy options require the municipalities to update the value of construction material using actual market value. The third option also do not require legislative changes as construction costs are calculated at the discretion of municipalities. Therefore, it would only require an administrative effort to assess the real market construction cost. That would yield Mt 11 billion for Maputo and Mt 11 billion for Matola in net present value (NPV) terms. It would be important also to segment the value of construction cost at least in three levels: low, medium and high-end construction. This would change the current way of using construction cost based on just one reference value (average) where those below have their property overestimate, and those above underestimated.

Maputo's arbitrated construction cost is much closer to nondurable material construction, rather than durable. As figure 23 shows, this is what causes the city to collect much less than it would, if it simply charged based on what construction cost residents really bore, out of building their own homes, rather than some arbitrated cost which does not reflect the reality of durable material homes costs. By setting the reference value of construction material low, the municipality is in fact giving an incredible subsidy to all those households living in more valuable properties.

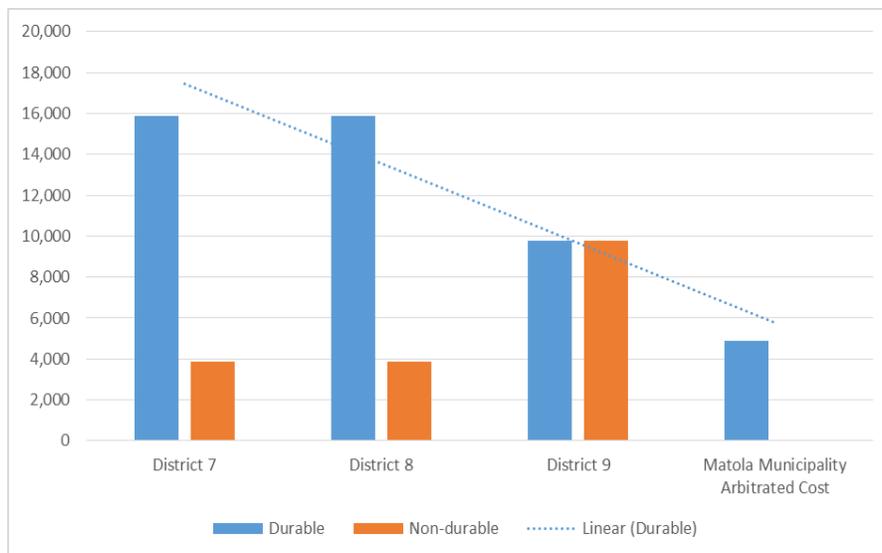
Figure 23. Construction costs according to market estimates (2016)



Source: Authors' calculation

Matola has less expensive, albeit not much less, construction cost per m². This obviously has little relation to any changes in terms of goods and services inputs, albeit some local labor components might be less expensive than in its peer city Maputo. The difference relies much more on the nature of the construction projects, which on the high-end finishing materials, end up being less sophisticated, and cater to a local, rather than to an international market. As one can see from the figure above, Matola municipality's arbitrated value is also comparable to nondurable material construction, rather than the durable material housing which usually, if not preponderantly pays IPRA in Matola.

Figure 24. Matola construction cost according to market estimates (2016)



Source: Authors' calculation

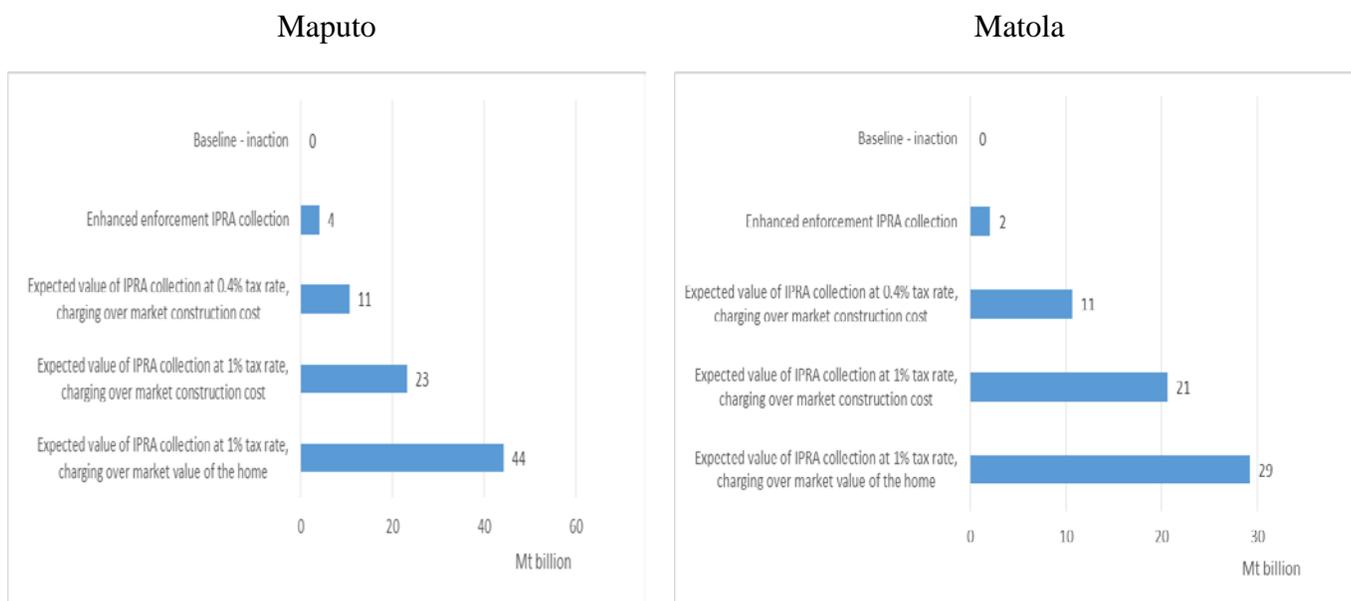
Scenario 4: Potential IPRA increase through changing tax rate to 1.0 percentage.

The four policy option would require the national government to change the IPRA formula in order to increase the tax rate from 0.4 to 1.0 percentage of the property value. The value of this policy change would yield Mt 23 billion for Maputo, and Mt 21 billion for Matola in NPV. This simple revision in the IPRA formula at national level would increase IPRA revenue for both municipalities significantly. Since an increase in local tax has a political dimension, the tax hike could be phased in several years, and first applied to the more valuable properties since this stock of prime real estate is currently highly subsidized. Progressive IPRA tax rates could be also applied to vacant land as a deterrent strategy to speculation. In any case, it would be important to change the legislation and allow municipalities to set their own IPRA tax rate, only setting minimum levels.

Scenario 5: Potential IPRA collection using property market value

The optimal scenario would combine all previous policies options, but would estimate the property value based on actual market value. This is clear winner by far for both municipalities. Changing tax revenue collection to 1 percent of a home’s market value, the Maputo City Council would generate Mt 44 billion in NPV, and Matola Mt 29 billion in NPV terms. This last policy option would be an important source of funds to support the needed infrastructure investment in GMA. Similarly, to make these increases in IPRA tax more acceptable, the municipalities could spread the tax hikes in 3 to 5 years, focusing first on the upper market properties and vacant land. That would revert the current regressive nature of the IPRA formula, and how it has been applied, and thus it would create a broader popular support for increasing IPRA collection.

Figure 25. Comparing revenue increases from various IPRA collection policy decisions



Source: Authors’ calculation

VI. Recommendations

Sheltering the largest share of the urban population and an important share of the country's economy, the Greater Maputo Area has a strategic role in promoting inclusive growth. Indeed, as in most other countries, urbanization, economic growth, and poverty reduction seem to go hand in hand. As this study showed, poverty has significantly declined in most of the Greater Maputo Area. Investments in improving urban infrastructure and services have been also associated with decline in urban poverty. However, the 'urban deficit' is still considerable, as the two main municipalities in the GMR, Maputo and Matola, have growth considerable faster than their capacity to provide basic services and urban infrastructure. With almost two million inhabitants, most living in underserved neighborhoods, the needs for infrastructure investment will only increase as the GRM population is expected to double in the next 25-30 years. In order to address these challenges, but also take advantage of GRM primacy to promote inclusive growth, it will be important to implement a combination of local and national government actions. Some actions are urgent as prerequisites for other actions, while others can be implemented more gradually. The findings of this study helped to identify several recommendations targeting both national and municipal government:

At National Level

Review the IPRA formula to better capture the real value of urban land. Reformulating the IPRA formula is critical and urgent. Instead of estimating property value based on construction costs, the property tax should guide municipalities to use market assessments to estimate property value. In addition, the property tax code should remove the reference on the value of the square meter of land, fixed at 5 percent of the value of the construction square meter. Indexes of property location should also be reviewed, with properties in more valuable neighborhoods valued accordingly. Without a regulatory framework that recognizes land markets, municipalities use different methods to estimate the value of land and property. For instance, based on the IPRA formula, a square meter of urban land is worth Mt 563 on average, while the land value assessment carried out for this study estimated that values range from Mt 14,402 to 21,603. This shows an inconsistency between the tax basis of IPRA and IASISA, which should be both based on an asset value that does not deviate from the market value.

Remove caps for municipalities to adjust the IPRA formula to increase revenue. The IPRA code needs to become more flexible to address the diversity of urban realities both across municipalities and within. To implement this change, the code should have only minimum parameters, and not impose a ceiling such as in the case of the 0.4 percentage property value rate, and the set rates for depreciation rate and location. By only imposing minimum parameters, the IPRA code could give autonomy for the municipalities that need urgent investments in urban infrastructure and services to strike a better balance in terms of local taxes and quality of living. This would be particularly important for Maputo and Matola in as citizens' expectations in a vibrant metropolitan area is much higher than in smaller urban centers.

Create a national information system with land, construction, infrastructure market prices references. The central government should establish basic guidelines for all municipalities to collect taxes using market prices. It should provide technical and financial support to the municipalities, helping them develop, deploy, upgrade, and maintain a permanent database. Market value data can provide key data on the asset value of transferred properties, as well as surface area and type of use. Analysis of the cadastral data can highlight the dynamics of urban growth, the pace of real estate speculation, and the potential for increasing land based infrastructure financing.

Review and incentivize municipalities to apply betterment levies. The Law 01/2008 that regulates betterment levies is limited and does not consider all kinds of public improvements for the purpose of cost recovery. Currently it is not applied for road pavements or curbs and gutters placements on existing or new roads. The law should be reviewed to improve contributions in cases where the public improvement directly increases the value of private property. These could include levies on new roads, enlargement, lighting, rehabilitation of squares and public roads; construction and expansion of parks and gardens; and beautification works in general. The central government could also provide more clear guidance and incentives through co-financing for municipalities to use betterment levies to recover all or part of the cost from infrastructure investment, particularly when these investment takes place in rich areas of the city.

Create new land based financing instruments. While decree 1/2008 includes the possibility of applying a betterment levy when public investment in infrastructure will in the near future result in increased property values, currently only property tax and transfer tax are being applied by municipalities in Mozambique. Betterment levies, while part of the own source revenue instruments, are not yet applied in Maputo and Matola. Likewise, new legislation would be required to create and regulate other land based financing instruments, such as developer extraction, land value increment taxes, sale of development rights, and land leases and sales.

Create a multiuse addressing cadaster unifying the cadasters from utilities and national, provincial, and municipal governments. Mozambique lacks a postal code system. The lack of a shared territorial base system for the central government, municipalities, and public utilities, makes the collection of user fees and property taxes very complex, costly and inefficient.

Monitor and evaluate municipal finances. It is important for the national government to periodically assess the performance of municipalities in collecting own-source revenue and create incentives (such as performance grants) to increase fiscal autonomy. Audit reports on municipal finances should be publicly available to create transparency and increase accountability.

At Municipal Level

Expand and periodically update the IPRA cadaster to include information on land and building characteristics. The real estate cadaster is the basis for the municipal information management system, where processes related to the registration and re-registration of land and construction are monitored and recorded. However, the system has important gaps and should include the features of the land, building, occupied area, use, and construction in order to help make appropriate tax assessments and apply a formula for IPRA that reflects market values and international best practice.

Integrate IPRA and municipal land registries to avoid duplications and save resources in expanding them. An information system must integrate IPRA, DUAT and IASISA registries as well as the Land Registry Office (Conservatoria de Registo Predial). This would help streamline procedures of all involved organs agencies, optimizing resources and increasing control and accuracy of records. The issuance of IPRA payment receipts is not directly linked to the actual “regularized” ownership of land. DUAT is predominantly handled in physical records while IPRA in electronic records. Therefore, when Maputo or Matola charges IPRA to all registered properties in its database, it might fail to capture all the DUAT holders.³¹ The implementation of the Integrated System of Municipal Management (Sistema Integrado de Gestão Municipal—SIGEM) should help integrate municipal data and enable a more efficient analysis, including data comparisons and triangulation.³²

Establish and operationalize the CAAPU with management autonomy and with the responsibility to evaluate properties, values, and indexes to establish the values of the IPRA and IASISA. Maps containing the market value of the properties in each of the districts and areas of the city could be prepared. This information would be disclosed to all citizens to guarantee access to information, especially for the most vulnerable families, whose property may be subject to stress-sales. The IPRA regulatory proposal, prepared by the Municipal Council of Maputo in 2009, could be used to professionalize CAAPU’s activities. In order to provide greater transparency and information dissemination, CAAPU’s composition should be expanded to more stakeholders, particularly representatives of the construction industries and universities.

Review urban structural plans to incorporate the new land value capture instruments. Municipalities should establish a new posture on the use and occupation of land, setting maximum urban indexes and coefficients for specific neighborhoods or regions, considering the local characteristics and needs of the community. When registering the property before a PPU or detailed plan, holders of vacant and underused land should obtain permits from the municipality. In case of noncompliance, they should be required to make social use of the property, under penalty of losing possession and returning it to the municipality.

Establish higher minimum penalties for nonpayment of property tax. Higher fines could help increase property tax collection. But penalties should be preceded or accompanied by a wide campaign to encourage payment of the overdue property taxes. The current dual-payment system (bank and Finance Department) is archaic, prone to errors and fraud. IPRA invoices are issued and delivered, and payment can be made at bank branches or directly to the Department of Finance of Maputo or Matola. Although payment at the Department of Finance is directly registered in the IPRA cadaster, those at banks are considered paid only when the actual payment slips are physically presented to the Department of Finance (and subsequently recorded in the IPRA cadaster). Most taxpayers seem therefore prefer paying the IPRA directly at the Department of Finance.

Set a limited period (1 year) for individuals and firms to pay overdue IPRA before increasing penalties. Preceding the amendments, fines and collection procedures, a campaign must be implemented for the settlement of debts in arrears, to encourage payment, before the implementation of new procedures.

Use legal procedures to recover assets of individuals and firms that owe IPRA. Procedures set out in legislation, such as public auctions, expropriations, pre-emptions, or judicial charges, should be used to recover resources from citizens and enterprises who have defaulted on their IPRA payments and give greater credibility and agility to the tax collection system. Clear and objective local regulations for IPRA should be set out and relevant information shared publicly, as stipulated by Decree 61/2010. Because the amount is set annually, it is critical to inform the population of these amounts by neighborhood/district and property type. It is also important to institute fines and penalties (such as judicial collection, under penalty of the property being sold, for example) for nonpayment or deliberately false information on the property value for tax purposes, as provided for IASISA in Decree 46/2004.

Improve Urban Poverty Targeting through Spatial Analysis of Poverty. The present exercise has shed light on how poverty has evolved between 1997 and 2007 in Maputo and Matola, looking at highest possible geographic disaggregation that would allow for reliable poverty estimates. The study showed that urban poverty has been on sharp decline in most neighborhoods of the Greater Maputo Area. But the findings also suggest that prevalence of poverty is higher in Matola. While in Maputo all units show a decline in poverty, in half of Matola's units there has actually been an increase in poverty rates. Poverty has also been associated with access to infrastructure and services, location, density and quality of housing. There has been also a higher influx of poor people in Maputo than Matola as land and housing costs in the city center of Maputo are increasingly unaffordable for most of the GMA residents. Poverty maps are therefore a useful tool to identify priority areas for interventions, prioritize pro-poor infrastructure investments, as well as better target affordable housing policies.

References

- Artur, L., and D. Hilhorst. 2012. "Everyday Realities of Climate Change Adaptation in Mozambique." *Global Environmental Change* 22(2): 529–536.
<http://doi.org/10.1016/j.gloenvcha.2011.11.013>.
- Baruah, Neeraj. 2015. "Splintered and Segmented? Fragmentation of African Cities' Footprints." Presentation at the Spatial Development of African Cities Workshop, World Bank, Washington, DC, December 16–17. <https://collaboration.worldbank.org/projects/spatial-development-research/blog/2016/03/18/spatial-development-of-african-cities-program-pilots-innovative-new-research>.
- Bedi, T.A Coudouel and K. Simler (2007) "More than a pretty picture: using poverty maps to design better policies and interventions". The World Bank Group.
- Constitution of the Republic of Mozambique - 16/11/2004.
- Centre for affordable housing in Africa (CAHF), 2016. "housing finance in Africa: a review of some of Africa's housing markets". Centre for Affordable Housing in Africa.
- Decree nr. 23/2008 - 01/07/2008 - approving the Regulation on Land Use Management.
- Decree 26/2011, of 15/06/2011 - Establishes the Organic Statute of environmental fund (FUNAB).
- Decree n ° 38 088, of 12/12/1950 - Code of Tax Executions.
- Decree In. 46/2004 - 14/09/2004 - Code of IASISA.
- Decree In. 60/2006 - 24/10/2006 - Regulation on Urban Land Use.
- Decree In. 61/2010 - approves mechanisms of determination and correction of the asset value of urban properties.
- Decree nr. 63/2008 - 30/12/2008 – Municipal Tax Code.
- Decree In. 65/2010 - 21/12/2010 - Alteration of the Legal regime of the State Housing Development Fund (FFH).
- Decree In. 66/98, of 08/12/1998 - Regulation of the Land Law.
- Dowall, D.E. 1991. The land market assessment: a new tool for urban management. Washington, DC: Urban Management Program, The World Bank.
- Elbers, C., J. O. Lanjouw, and P. Lanjouw. 2003. "Micro-Level Estimation of Poverty and Inequality." *Econometrica* 71 (1) 355–64.
- ESRI Portugal. 2015. Report First Phase of SIGEM Expansion.
- Haughton, Jonathon, and Shahidur R. Khandker. 2009. Handbook on Poverty and Inequality. Washington, DC: World Bank.

Hawkins, P., and O. Muxímpua. 2015. *Developing Business Models for Fecal Sludge Management in Maputo*. Washington, DC: World Bank.

Japan International Cooperation Agency. 2014. *Comprehensive Urban Transport Master Plan for the Greater Maputo*. Retrieved from: http://open_jicareport.jica.go.jp/pdf/12152609.pdf.

INE (National Institute of Statistics). 1998. *Inquérito Nacional aos Agregados Familiares 1996/1997*. Maputo, Mozambique: INE.

INE. 2010. *Inquérito sobre Orçamento Familiar 2008/2009*. Maputo, Mozambique: INE.

INE Statistics (database). Maputo, Mozambique: INE. Available at: <http://www.ine.gov.mz/estatisticas>.

INE. 2010. *Inquérito sobre Orçamento Familiar 2008/2009*. Maputo, Mozambique: INE.

Law In. 02/97, of 28/05/1997 – Basic Law of municipalities.

Law In. 19/2007, of 18/07/2007 - Territorial Planning Law.

Law In. 01/2008 - 16/01/2008 – Defining the Financial, Budgetary and Asset Values of the municipalities and municipal tax system.

Lusaka, December 2000. Retrieved from: <http://www.paris21.org/sites/default/files/949.pdf>.

MAEFP. 2013. Report of the basic diagnostic of municipal finances. Cities and Climate Change Project.

MAEFP. 2014. Baseline Study for the Program of Massive Land Regularization (DUATs). Climate Change Project.

Maputo Chapa project retrieved from <https://chapasproject.wordpress.com/>.

Maputo City Council. 2009. Regulation of Property Land Tax (IPRA) Proposal.

Maputo City Council. 2009. Plano of Urban Structure of the City of Maputo, Seminary on Urban Poverty, Maputo.

Maputo City Council. 2012. Evaluation of the environmental impact of the General Urbanization Plan of Katembe.

Maputo City Council. 2015. Requalification of Polana Caniço A and B – Economic and Financial Feasibility study, 29 of December 2015.

Maputo City Council. 2015. Model of Technical and Financial Sustainability for the Massive Regularization Program (DUATs).

Mid Term Fiscal scenario for the period 2016-2018, Maputo, July 2015.

Maputo Transport network information retrieved from <http://www.emtpm.co.mz/index.html>.

Matola City Council. 2016. Manual for the Evaluation of urban properties.

Ministry of Public Works and Housing (2011) Housing Policy and Strategy for Mozambique.

Paranacidade. 2014. Action Plan for the implementation of IPRA.

PARIS21 Regional Workshop Paper. 2000. The Poverty Reduction Action Plan in Mozambique.

Regulation of Municipal Property Tax (IPRA) - Proposal - City Council of Maputo – 2009.

Resolution In. 53/AM/2011 - 16/03/2011 - Municipal Assembly of Maputo.

Resolution 19/2011 - of 08/06/2011 - Policy and Strategy of Housing

Republic of Mozambique. 1975. *Constitution of the Republic of Mozambique* from 25th of June 1975.

Republic of Mozambique. 2012. *Relatório da Revisão do sector de saúde*, September 2012.

Republic of Mozambique. 2007–2015. *Final Report of the Citizen Satisfaction Report Card*. Maputo Municipal Council, Maputo.

Terra. 2017. “Preço do metro quadrado em Sao Paulo”. Terra.com.br. Confirma o m2 para venda mais caro de Sao Paulo. 5/2/2017 from terra economia infograficos

The World Bank. 2013. “Doing Business in Bogota, Colombia”. Doingbusiness.org. The World Bank Group. 5/2/2017. Data from Subnational Doing Business 2013.

The World Bank. Doing Business (database). Washington, DC: World Bank. Available at: <http://www.doingbusiness.org/data>.

UNESCO. 1997, 2007. *World Inequality Database on Education (WIDE)*. Retrieved from: http://www.educationinequalities.org/countries/mozambique/indicators/edu0#?dimension=all&group=all&age_group=edu0_prim&year=2008.

UNHABITAT. 2016. *Leveraging Land Based Finance for Local Governments: A Reader*.

UNU-EHS. 2014. *World Risk Report 2014*. United Nations University Institute for Environment and Human Security (UNU-EHS).

United States Department of Labor. 2014. *Findings on the Worst Forms of Child Labor*. Mozambique country profile. Retrieved from <https://www.dol.gov/agencies/ilab/resources/reports/child-labor/mozambique>.

WHO. 1997, 2007. *World Health Report Statistician Annex*. Retrieved from <http://www.who.int/whr/annexes/en/>.

WHO. 1997, 2007. *Global Health Observatory data repository*. Retrieved from <http://apps.who.int/gho/data/node.main.A1444?lang=en&showonly=HWF>.

World Bank. 2009. *Mozambique Municipal Development: Lessons from the First Decade*.

World Bank. 2010. *Analysis of Municipal Revenue Potential in Mozambique, Summary Report*.

World Bank. 2015. *Country Partnership Framework for the Republic of Mozambique*. For the period FY16-FY20.

World Bank. 2015. *Stocktaking of the Housing Sector in Sub-Saharan Africa: Challenges and Opportunities*. Washington, DC: World Bank.

World Bank. 2015. *Strategical Plan for the development of the fiscal and financial management for Matola City Council*.

World Bank. 2016. *Africa's Pulse*. Vol. 13. Retrieved from <http://documents.worldbank.org/curated/en/2016/04/26197314/africas-pulse-april-2016>.

- World Bank. 2016. Accelerating Poverty Reduction in Mozambique: Challenges and Opportunities. Washington, DC: World Bank.
<http://documents.worldbank.org/curated/en/383501481706241435/pdf/110868-ENGLISH-PUBLIC-Final-Report-for-Publication-English.pdf>.
- World Bank. 2017 (upcoming). Mozambique Urbanization Review. Washington, DC. World Bank.
- UN-Habitat. 2003. The Challenge of Slums: Global Report on Human Settlements 2003. London: Earthscan.

End Notes

¹ Source: INE Household Welfare Surveys (IOF 1997, 2007).

² The World Bank, and other development partners have been supporting and participating in the ongoing decentralization and urban development policy debate under the framework of current operations (Cities and Climate Change Project (P123201), and National Decentralized Planning and Finance Program (P107311)). After the announcement of the National Five Year Plan in early 2015, MAE and MEF are preparing studies and strategies to operationalize national support to municipalities and districts as a framework to new national urban and municipal development programs.

³ At the time this study was conducted, the INE was undertaking the last household survey (IOF 2017), and planned to carry out the next population census in the end of 2017. Once these both datasets are available it will be possible to produce a more up-to-date poverty map of GMA.

⁴ For Maputo Municipality, the smallest urban administrative division available is the district (there are no administrative posts in Maputo Municipality), whereas in Matola Municipality it is the administrative post.

⁵ The two isolated districts are Ka Tembe and Ka Nyaka.

⁶ World Bank (2016).

⁷ Units 12 and 13

⁸ Here, as in the headcount analysis, it is also important to consider the confidence intervals for a more precise assessment.

⁹ It is the household's responsibility to build a sanitation facility in Maputo. Installation of a septic tank costs US\$220, and an improved latrine US\$54 (Hawkins and Muxímpua 2015).

¹⁰ Toilets connected to a septic tank in the 2007 census does not necessarily mean the toilets are connected to sewerage. In Maputo in 2013, only 9 percent of residents had sewer connections (Hawkins and Muxímpua 2015).

¹¹ The share of each type of infrastructure access for each *bairro* is calculated from census data for 1997 and 2007 and household survey collected by the World Bank Water and Sanitation Program (WSP) in 2013. The WSP surveys were collected from 1,273 households in 47 *bairros* in Maputo City. See Hawkins and Muxímpua (2015) for more detail.

¹² A series of fixed-effect regression models for *bairros* in 1997 and 2007 were estimated. Some *bairros* are aggregated to larger *bairros* as in the preparation of poverty mapping. The models control for time-invariant *bairro* characteristics, such as distance from the CBD and area, although this alone does not guarantee causality.

¹³ Estimating the same models by excluding *bairros* with relatively lower poverty rates, the results did not change much except that for septic tank, whose linkage with poverty rates become negligible.

¹⁴ Calculations based on the WIDE data base numbers. Retrieved from http://www.education-inequalities.org/countries/mozambique/indicators/edu0#?dimension=all&group=all&age_group=edu0_prim&year=2008.

¹⁵ Mozambique's education system is organized in three main stages: primary from 7 to 10; secondary from 11 to 18; and higher education. Primary education is free.

¹⁶ Idem.

¹⁷ United States Department of Labor: 2014 Findings on the Worst Forms of Child Labor, Mozambique country profile. Retrieved from <https://www.dol.gov/agencies/ilab/resources/reports/child-labor/mozambique>.

¹⁸ Calculations based on WIDE database numbers. Retrieved from http://www.education-inequalities.org/countries/mozambique/indicators/edu0#?dimension=all&group=all&age_group=edu0_prim&year=2008.

¹⁹ Programa de Desenvolvimento Espacial <https://mozgis.gov.mz>

²⁰ Republic of Mozambique: *Relatório da Revisão do sector de saúde*, September 2012.

²¹ WHO Global Health Observatory data repository. Retrieved from <http://apps.who.int/gho/data/node.main.A1444?lang=en&showonly=HWF>.

²² WHO *World Health Report* statistical annex. Retrieved from <http://www.who.int/whr/annexes/en/>.

²³ Despite data limitations, multiple sources of existing data was used to determine whether the poor are more likely to be affected by flooding in the Greater Maputo Area. No historical, georeferenced data of flood events are

adequate for spatial analysis of flood hazards at the local level (for instance, high-resolution satellite images from the floods in 2000 and 2013). To determine the possible extent of pluvial flooding in the GMA—areas at risk of flooding after heavy precipitation—the analysis uses spatial data from the Drainage and Sanitation Master Plan for Greater Maputo in 2016.²³ As part of the preparation of this Master Plan, “problematic” (flood-prone) areas in the GMA were identified by crossing the following sources of information: analysis of a digital terrain model to identify low-lying areas that were validated with aerial photography on Google Earth; information provided by the technical staff of the Municipal Councils of Maputo and Matola; and information provided by field technicians after site visits. The dataset covers the entire GMA except Katembe. The dataset distinguishes between “natural” or “reserve” flood-prone areas (which should in principle be uninhabited) and those occupied by urban settlements. The analysis is based on overlaying the available flood hazard data from the Master Plan with poverty and population density figures for 2007 (calculated by the World Bank based on the household survey 2008/09 and population census 2007) as well as spatial data on built-up area from the Global Human Settlement Layer (GHSL) for 1990 and 2014, as well as satellite imagery from GoogleEarth.

²⁴ P-13 report, Component C - Municipal Finance - Swiss Agency for Development and Cooperation, Austrian Development Agency, World Bank, April 2011.

²⁵ Campinas City Council, Department of Finance, 2014.

²⁶ African Tax Institute – University of Pretoria, McCluskey and Franzsen, 2013.

²⁷ Campinas City Council, Department of Finance, 2014.

²⁸ African Tax Institute—University of Pretoria, McCluskey and Franzsen, 2013.

²⁹ Decree 61/20100

³⁰ Report of the Support Program of 13 Municipalities within the Center and North of Mozambique (P-13)—Component C—Municipal Finances.

³¹ The data on which was gathered either at the time of granting the Property License Agreement; or at the inspection before the preparation of a detailed plan of each district; or through a municipal regularization program.

³² According to the 2007 UN-Habitat document "Profile of the Urban Sector of Mozambique", in cases where municipal cadaster services exist and the area is covered by an official plan of land use, access for an individual DUAT was achieved after around 103 bureaucratic steps and three years.