Sites and Services and Slum Upgrading in Tanzania

(Preliminary and incomplete)

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Introduction

• Slums are common in African cities

• Want to understand conditions for their formation & persistence

• Does it matter whether infrastructure investments are made after squatters arrive, or before they do?

• Study long run impact of World Bank urban investments in Tanzania
“Sites and Services” and “Slum Upgrading”

• Investments took place in seven Tanzanian cities
  • Similar infrastructure laid out during late 1970s and early 1980s in both:
    • 11 “Sites and Services” areas (greenfield investments)
    • 12 “Slum upgrading” areas (upgraded squatter settlements)

• Want to examine long term impact on present-day outcomes:
  1. Will eventually compare outcomes in these to nearby “control” areas
     • Caveat: selection into serviced areas
  2. Study the persistence of roads within the Sites and Services areas
  3. Examine effects of roads on housing within Sites and Services areas
  4. Contrast Sites and Services to Upgraded Slum areas
Main (but very preliminary) messages

High persistence of roads and plots from 1970s to present day

High Land Values per m$^2$ in Sites and Services compared to rest of Dar

- Intermediate absolute plot values
- Medium-small plots
- High fraction of built area

$\rightarrow$ High value per m$^2$ of land

- In contrast, slum upgrading areas, which received qualitatively similar set of services AFTER squatters arrived, have smaller and less valuable plots
  - Still, unit cost of slum upgrading was lower than that of “Sites and Services”
Project costs

• Cost of Round 1: US$13 million in 1977 (US$54 million in 2016)
  • Infrastructure (largest cost component): roads, water, drainage, electricity
  • Also paid for community buildings, land, and a few other costs
  • Just over 23,000 units: ~8,500 new plots and ~14,500 upgrades
  • Unit costs in 2016US$: ~US$1,700 per new plot, ~US$750 per upgraded plot
    • Excludes loans scheme, which later failed because of poor repayment rates

• Cost of Round 2: US$26 million in 1982 (US$65 million in 2016)
  • Similar, but excluded electricity and community buildings
  • Around 31,000 units: ~11,000 new plots and ~22,000 upgrades
  • Unit cost averaged across both types in 2016US$: ~US$1,200
## Areas with Sites and Services treatment

<table>
<thead>
<tr>
<th>City</th>
<th>Area within city</th>
<th>Round</th>
<th>Treatment area known</th>
<th>Detailed treatment map</th>
<th>Pre-treatment satellite photos</th>
<th>Pre-treatment topographic map</th>
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<tbody>
<tr>
<td>Dar es Salaam</td>
<td>Sinza</td>
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<td>Y</td>
<td>N (try to get)</td>
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<tr>
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<td>Gofu Juu</td>
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<td>Isebya</td>
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<td>(Y)</td>
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<td>Kihesa &amp; Mtuiwila</td>
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<tr>
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Example of map with slum grading (solid red) and sites and services (red lines) in Tabora
Tabora: example of color map showing treatment areas (zoomed in to show roads)
Detailed map of Sites & Services in Sinza (Dar)

Map shows locations within Sinza Sites & Services (greenfield) area:
1. Roads of varying quality
2. Electric power & streetlights
3. (Water supply)

[Not shown: schools, health centers, markets]
Dar 1966: Example of Historical Satellite Imagery
## Completed Plots and Present Day Plots in 3 Sites and Services locations in Dar es Salaam

<table>
<thead>
<tr>
<th>Area</th>
<th>Historical # completed sites and survey plots</th>
<th>Present day # plots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sinza</td>
<td>3,834</td>
<td>4,159</td>
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<tr>
<td>Kijitonyama</td>
<td>1,774</td>
<td>2,651</td>
</tr>
<tr>
<td>Mikocheni</td>
<td>730</td>
<td>800</td>
</tr>
</tbody>
</table>
What outcomes can we analyse?

• For parts of Dar es Salaam:
  • House valuations for taxation (circa 2012-2013). Needs some cleaning.
  • Same dataset indicates residential vs. commercial use
  • Can calculate value per area of plot
  • Assessed tax available for more plots, but some only matched to “sub ward”
  • [Also have built area shapefiles, could calculate value per building footprint]

• For rest of Tanzanian cities:
  • Look at modern images to assess building size, regularity, roof material, etc.
  • Trying to get cadastral data!
Property Values in Dar and Sites and Services
Property Values by Plot Land in Dar and Sites and Services
Median plot values by sub-ward, including:
(i) imputations from tax data
(ii) unmatched plots
Mean plot values by sub-ward for outlined plots
Why is value/m² high in Sites and Services?

Sinza has a high building footprint to plot area ratio

Oyster Bay has a low building footprint to plot area ratio
Residential vs. Commercial Use in Dar
Sinza, Dar es Salaam: Example of Road Persistence

Sites and Services plan

Present day imagery and plot land values
South Sinza: Sites and Services Plan
South Sinza: Example of Plot Persistence
Modern Day Plots and Imagery
Sinza (new sites) top left
• Organized roads
• Medium-small sized plots
• Higher land values

Manzese (upgrade) bottom right
• Disorganized roads
• Small, irregular plots
• Similar built area fraction
• Lower land values
Even in upgraded slum (Manzese) the general pattern of roads persisted for the most part.
But when you zoom in you see that building density in Manzese (slum) has increased.

In Western parts of Dar today you also see what look like sparse slums...
Taking stock: what are the rates of return?

• What is value of median house in Dar Sites and Services locations worth today?
  • Upper bound based on 45 contemporary listings in Sites and Services locations (highly elected, most likely inflated asking prices)
  • Lower bound from cadastral data, which could be several years old (and most likely biased downwards)

• Depending on which of these numbers is more realistic, the rates of return can vary quite a lot
Bottom line (for now, very preliminary)

• Effects of Sites and services (in greenfield areas):
  • Strong persistence of road network
  • Present day plots medium-small
  • High land values per square meter of land
    • This seems to contrast with the slum areas, so timing of treatment matters

• Going forward we plan to examine:
  • Examine effect of roads on price and quality of housing within Sites & Services
  • Look more at the upgraded slum areas
  • Work on sites and services areas outside of Dar
    • Need more outcome data (Worldview imagery, hopefully cadastral data)