JUNTOS PERO NO REVUeltOS

Social Stratification and Urban Densification in Bogotá, Colombia

Juan Guillermo Yunda | PhD Dissertation
Community and regional planning
University of Texas at Austin  2017
PROBLEM:

- Bogotá, Colombia, (Pop. 8M) is the densest city in Western Hemisphere, however with severe socio-spatial inequalities.

- The wealthier North is “compact and connected,” with residential areas in proximity to jobs, parks and retail centers.

- The poorer South suffers from overcrowding, insufficient transit infrastructure, high crime and environmental pollution.
CONTEXT (I):

- A history of changing planning policies has shaped the city's uneven density and socio-spatial divides.
- Between 1940s to 1970s, the city sought to implement a planning model imported from the US, based on Euclidean zoning and road plans.

A. SPRAWLED CITY

Private Sector Development

Public Sector Infrastructure Provision

URBANISM = ROAD PLAN + ZONING
DENSITY = LOW

Accessibility to Jobs - Private vehicle

Graph elaborated by the author
CONTEXT (I):

• However, this planning model led to urban sprawl and enduring spatial segregation.

• Private sector urban development led to suburbanization for the elites and informal urbanization for rural migrants.

North of Bogotá, 1960s. (Villegas, 2010)

South of Bogotá, 1960s. (Villegas, 2010)

Social sectors of Bogotá 1946. (UNAL, 2017)

Bogotá’s Zoning plan 1940. (UNAL, 2017)
CONTEXT (II):

- Later, as a response to sprawl and socio-spatial segregation, from the 1980s to the 2000s the city established growth limits and incentivized the densification of the city center.

- This planning approach was based on European principles of growth management and normative theories of Good City Form.

B. COMPACT CITY

```plaintext
URBANISM = FORM BASED NORMATIVE
DENSITY = HIGH
```

Graph elaborated by the author.
CONTEXT (II):

• The comprehensive plan, Acuerdo 7 of 1979, set an urban services boundary (USB) and incentivized densification in a central mega-core area and a set of sub-centers.

• This was part of a broader urban development strategy called Ciudades dentro de la Ciudad.
CONTEXT (III):

• However, the city remains socially segregated

• Densification has been moderated by the private sector...while private sector decisions are influenced by patterns of social segregation and perceptions of “social class”

• Ultimate result: an “uneven city”
STRATIFICATION SYSTEM

- Stratification is a system of cross-subsidies between social classes for utilities' bills payments.
- It is based in the classification of city blocks into one of six different zones based on built form characteristics.

The built form of each strata (DAPD, 2004)

- **Strata 1**: Settlements of informal origin
- **Strata 2**: Affordable row housing or multi-family blocks
- **Strata 3**: Condominium or single family housing

Stratification map (Decreto 291 of 2013)
THEORETICAL FRAMEWORK

• Densification and “Compact City”
• Polarization vs. fragmentation
• “Arranged Urbanism”

Criticism of Densification and “Compact city” approaches

• Densification enforced to preserve rural areas, make cities more energy-efficient and integrate social and economic clusters.

  CNU & Talen, (1999); Florida (2002)

• However critics argue that densification produces gentrification, don’t contribute to make housing more affordable and have a complex relation with social diversity

  Day (2003); Pendall & Carruthers (2003); Fainstein (2005); Bramley & Powers (2009)
Latin American Socially-Segregated Urban Form

- Uneven urban form was thought to be distinguished by informal urbanization, residential polarization and spatial mismatches


- However, scholars now argue that the scales of segregation are changing due to neoliberal changes introduced in the 1990s, in a process known as “fragmentation”

  Sabatini & Brain (2008); Janoschcka (2002)
Private Sector-Led Urban Planning & Design

- Neoliberalism is having a great impact on Latin American urbanization. Private actors have unofficially shaped public sector decision-making in order to increase profits, in both formal and informal urban development.

*Cortés Solano (2007); Koch (2015)*

---

**THEORETICAL FRAMEWORK**

- Densification and “Compact City”
- Polarization vs. fragmentation
- “Arranged Urbanism”
RESEARCH GOALS:

1. Determine if a relationship exists between incremental densification and the social Stratification system.

2. Identify the consequences of this relationship in terms of spatial disparities in the production of new areas of housing and businesses.

3. Identify the consequences of this relationship in terms of socio-spatial segregation.

4. Explore the mechanisms that facilitate this relationship.
RESEARCH METHODS:

- Convergent-parallel mixed methods design.
- Spring/16 – Field surveys, compilation and preliminary analysis of quantitative data (building permits 2010/15 and the Multipurpose surveys 2007/14).
- Summer/16 – In-depth and informal interviews with local developers, policy makers and scholars.
- Fall/16 and Spring/17 – Analysis of the data and writing.
- Insider/outsider conflicts – Independent researcher vs. growing up in the city; and Planner vs. Architecture practitioner.

Field survey North. Photo by the author

Graph elaborated by the author

Field survey South. Photo by the author
DENSIFICATION DATA 2010-2015 (I)

First, a broad analysis of the data suggest that densification is biased to the higher strata areas.

<table>
<thead>
<tr>
<th>Population</th>
<th>Land Area</th>
<th>Total m2 Housing</th>
<th>Total m2 Business</th>
</tr>
</thead>
<tbody>
<tr>
<td>3%</td>
<td>41%</td>
<td>19%</td>
<td>27%</td>
</tr>
<tr>
<td>10%</td>
<td>30%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2%</td>
<td>2%</td>
<td>6%</td>
<td>2%</td>
</tr>
<tr>
<td>7%</td>
<td>12%</td>
<td>27%</td>
<td>41%</td>
</tr>
<tr>
<td>10%</td>
<td>35%</td>
<td>21%</td>
<td>10%</td>
</tr>
<tr>
<td>6%</td>
<td>36%</td>
<td>2%</td>
<td>7%</td>
</tr>
<tr>
<td>2%</td>
<td>41%</td>
<td>12%</td>
<td>30%</td>
</tr>
<tr>
<td>0%</td>
<td>0%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>0%</td>
<td>0%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>10%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>20%</td>
<td>30%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>30%</td>
<td>10%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>40%</td>
<td>10%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>50%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>60%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>70%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>80%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>90%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>100%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Stratification and densification new housing and business 2010-2015. Elaborated by the author based on SDP
Secondly, the location of densification projects shows that these do not comply with the structure set by the comprehensive plan (POT).
DENSIFICATION DATA 2010-2015 (III)

A econometric analysis (Log-Log OLS) explore the relationship between the size of the projects and Stratification, controlling for physical and locational characteristics of the lots:

- **There is a positive and significant relationship between Strata with the size of the projects.**

D.V.: Building Area

**Strata:** 0.148***

Distance to BRT: -0.004

Size of the lot: 1.035***

Observations: 2,059

R-squared: 0.84

“(***”) Significant at 99%; “(*)” Significant at 95%; “( )” Not Significant
DENSIFICATION & SOCIAL SEGREGATION LEVELS 2007-2014

A bivariate correlation analysis explores if densification patterns were related with the changing social segregation levels of the city. I used as proxy the education levels of the population (+25 y/o).

- Bogotá is segregated between a highly educated northeast and a lower educated south and west.
- For the period 2007-2014 segregation levels increased in the Strata 1, and Strata 5-6 and decreased in the others.
**DENSIFICATION & SOCIAL SEGREGATION LEVELS 2007-2014**

- The bivariate correlation curve shows that segregation is negatively correlated with densification in Strata 2, 3 and 4, while it is positively correlated with densification in Strata 5-6.

- However the low $R^2$ (.18) shows that there is a large unexplained relationship that may be attributed to secondary housing markets and rental units.

\[
\Delta \text{Entropy} = 0.0102 \cdot \text{Built Area} - 0.1689 \cdot \text{Built Area}^2 + 0.0527 \cdot \text{Built Area}^3
\]

\[
F(3, 37) = 2.751, p<0.056 \quad R^2 = 0.1824
\]
MECHANISMS (I):

The influence of the Stratification on densification responds to a local discourse of real estate that appraises land based on the social strata that occupies it.

“The value of the land depends on the social strata that occupy it. The experience of our cities indicates that the higher strata lead development. Around them tend to cluster the middle strata. The planning system then, segregates the popular levels (lower strata) from the high and middle strata…”

Borrero-Ochoa, 2000. Page 18

Appraisal of Real Estate and Underwriting.
(Borrero-Ochoa, 2000)
MECHANISMS (II):

However, local planning regulations and practitioners ignore or downplay the role of Stratification in urban development.

“The city gave them a name (Strata) and suddenly no one wants to live there? No! it has to do with the available infrastructure, living conditions, and urban services.”

“The public sector has seen it (Strata) always as a result, but not as a policy instrument…”

“The social differentiations in the city have ceased to exist.”

Quotes from interviews with officials working at Bogotá’s city planning office (SDP)
MECHANISMS (III):

As result, the private sector have informally influenced the drafting of local density and land-use regulations (UPZs), to maximize profit from land markets in high Strata areas.

“Many of the UPZs do not comply with the original plan..”

“We messed up with the UPZs!”

“Regulating the UPZs is more difficult!”

“The markets put on pressure!”

Quotes from interviews with planning practitioners

“We think the norms (UPZs) are beneficial…”

“It is better (for us) the norms of the UPZs than others…”

Quotes from interviews with developers
FUTURE TRENDS (I):

Facing scarcity of high strata areas Legacy large-scale developers prefer to move to the periphery instead of investing in lower strata areas.

“Yes, (Stratification) is important because the different strata have different taste for the real estate business.”

(Me) Strata 6 is saturated which leads you to move to other parts of the city, the question is if you are doing that?

Of course, in Cajicá, outside the city!”

…it has been demonstrated that a government that does not offer… is a city that will see the (housing) production costs rise…

Quotes from interview with the owner of a developer firm with more than 40 years of history
FUTURE TRENDS (II):

While, there is an emerging young/grassroot developer class working in Strata 3 areas, previously at the margin of the formal real estate market.

“We do not instantaneously reject when a lot arrives located where ‘I have no idea’…”

“It is the first time that we have worked in the South, we have always been towards the North…”

“We grew up in this neighborhood, my father had a fabric store, but now we have moved into construction.”

“All this has been done with no architects.”

Quotes from interview with developers investing in the south of Bogotá.
FUTURE TRENDS (II):

However this new densification in Strata 2 and 3 faces challenges such as speculation with land prices, opposition of communities, and the informal property structure and use of buildings.

“For example, we have tried to do many projects, but those are productive houses… it makes these types of negotiations more difficult.”

“Two years ago we bought seven houses in this neighborhood for 1,500 million, everybody in the neighborhood freaked out… Now each neighbor is asking for 1,500 million for each house…”

Quotes from interview with developers investing in the south of Bogotá.
CONCLUSIONS

- Social Stratification moderate densification patterns in Bogotá, strongly than the POT, transit access, or lot sizes.

- Planning norms and policy makers ignore/downplay this relationship.

- In the latest decades the private sector have informally influenced the codes to allow more density in the higher-strata areas.

- This has contributed to uneven high density patterns but also to a limited urban sprawl into the region.

- Legacy large-scale developers have moved to the periphery facing shortage of high-strata land.

- But an emerging class of young/grassroots developers are investing in areas previously outside of the formal real estate market.
SPATIAL OUTCOMES (I):

Periodical increments in height limits have been systematic since 1979 in high-strata areas

Consequently densification norms had done little to eliminate overcrowd in the lower-strata areas
SPATIAL OUTCOMES (I):

In the higher-strata block, height limits have increased periodically; while in lower-strata blocks, heights increases have been limited, incentivizing informal densification.
SPATIAL OUTCOMES (II):

However, Bogotá became the densest city in the region, and sprawled much less than other peer large-cities as result of Stratification and densification policies.

CONTRIBUTIONS TO THEORY

- **To the criticism of Densification:** Normative discourses based on densification are unable to address the current planning challenges without a broader social-class perspective.

- **To Polarization/Fragmentation in Latin American cities:** Social fragmentation is not even across the city. It is higher in the inner-ring suburbs (Strata 3) party because of the agency of young/grassroots developers. However, at top high and low-strata areas polarization continues.

- **To “Arranged Urbanism:”** The process of the UPZs in Bogotá demonstrates how the breaking up decision making within the public sector facilitates the influence of the private sector in planning rules, under a neoliberal framework of urban development.
CONTRIBUTIONS TO PRACTICE

- Stratification is a powerful tool, not only to fund the infrastructure in lower-income areas, but also to incentivize densification in the city. The results of this research suggest that the private development sector follow the stratification more than any other policy of spatial planning.

- Therefore, looking forward to the POT-2017, the results of this research suggest working for a better articulation between the Stratification and the local density and land-use regulations. This may achieve redevelopment patterns that are more predictable and provide a cross-subsidy between social groups.

- The results of this research also point to pay attention to the new densification trends in the Strata 3. Future research should address if these new trends are improving the built form in lower income areas or provoking displacement and gentrification.
The results of this research identified the forces that shape urban development in Bogotá; pointing out how these forces are also out of public scrutiny, participation and control.

I believe that technological advances may help to bring transparency to urban development processes and incentivize a more productive citizenship engagement.

- **Postdoctoral COLCIENCIAS Fellowship**: Development of a scenario-based planning application adapted to the Colombian context. Application due: June-July 2017

- **2 Scientific Publications**: (Submit by end of 2017)
  
  Quantitative: Proving the influence of Strata in densification  
  Qualitative: Exploring the influx of Strata on developers

  *International Journal of Urban and Regional Research (IJURR); Urban Studies; Cities; Urban Affairs Review*
REFERENCES


