Monitoring Global Urban Expansion
Using Remote Sensing and a Network of City-Based Researchers

Alejandro Blei, NYU Stern Urbanization Project
October 6, 2015
Session 5. Complementing traditional data sources: A.M. Blei (New York U.) – Monitoring global urban expansion using remote sensing and a network of city-based researchers
• Presently no goal, or metrics, that pertain to the development and performance of the world’s cities.

• Proposed research program is to make progress in filling that void.

• Broad goals: adequate, properly serviced, affordable lands for growing populations.

• The proposed methodology for carrying out this task is the Monitoring Urban Expansion program.
Task 1: Identify the universe of cities
- **Universe of 4,245 cities → Sample of 200 cities**
  - Stratified on three dimensions
    1. **Region**
    2. **City population size bins**
    3. **Number of cities in country > 100,000 inhabitants**

<table>
<thead>
<tr>
<th>World Regions</th>
<th>City Population Bins</th>
<th>Number of Cities in Country &gt;100k</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. East Asia &amp; Pacific</td>
<td>1. 100,000 - 471,000</td>
<td>1. 1 to 9</td>
</tr>
<tr>
<td>2. Southeast Asia</td>
<td>2. 471,000 - 1,250,000</td>
<td>2. 10 to 19</td>
</tr>
<tr>
<td>3. South &amp; Central Asia</td>
<td>3. 1,250,000 - 4,850,000</td>
<td>3. 20 +</td>
</tr>
<tr>
<td>4. Western Asia &amp; Northern Africa</td>
<td>4. 4,850,000 +</td>
<td></td>
</tr>
<tr>
<td>5. Sub-Saharan Africa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Latin Am. &amp; Caribbean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Europe &amp; Japan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Land Rich Developed Countries</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
• 8 regions × 4 population bins × 3 cities in country bins = 96 ‘boxes’.
• 76 non-empty ‘boxes’ in universe.
• Sample city selection is roughly proportional to relative frequencies of urban population in the different boxes
• Weighting ensures that the sample is representative of universe.
Task 2: Select the sample of 200 cities
Urban Expansion in Accra, Ghana 1991 - 2014
Phase II: The Quality of Urban Layouts
## Phase II:
The Quality of Urban Layouts

<table>
<thead>
<tr>
<th>Share Residential Area in Atomistic Development</th>
<th>Share of Area Occupied by Roads and Boulevards</th>
<th>Share of Roads Less than 4 Meters Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>92 ± 7%</td>
<td>8 ± 2%</td>
<td>67 ± 13%</td>
</tr>
</tbody>
</table>
Phase III: The Land and Housing Survey in the Global Sample of Cities
Phase III:
The Land and Housing Survey

City Footprint

Expansion Area
Session 5. Complementing traditional data sources: A.M. Blei (New York U.) – Monitoring global urban expansion using remote sensing and a network of city-based researchers
Thank you!

Questions/Comments/Contact:

Alex Blei
Coordinator, Monitoring Global Urban Expansion
ablei@stern.nyu.edu

or

Solly Angel
Leader, NYU Stern Urban Expansion Initiative
sangel@stern.nyu.edu