Regional Workshop on Data Capturing Methods and Reporting of Human Settlement Indicators in Arab Countries

Global City Definition

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Outline

• Why define a city
  • Multiple definitions and their implications on data comparability
  • Spatial data needs and functional city definition
• Emerging functional city definitions
  • The process towards a functional city definition
  • Two candidate definitions
  • Translation of emerging definitions in space
  • The role of national statistical agencies and local authorities in the process
• Some emerging challenges
• Some emerging opportunities
• Conclusions
The goal of a Global City Definition is **NOT TO CHANGE EXISTING** administrative and statistical definitions in countries, but to adopt a functional unit for monitoring city specific indicators – e.g Goal 11
Why define the city?

“Cities are where the battle for sustainable development will be won or lost”

• To win the battle, **data and urban systems** are needed at the city level.
  ..........**Have these not been there before?**

• **YES**, city data has been generated for decades,
  **BUT** ....
  
  • Multiple definitions have been adopted at varying contexts, making data comparability difficult
  
  • Spatial indicators require unique information that may not be extracted consistently using the existing definitions
  
  • Urban SDG indicators are very sensitive to boundaries

<table>
<thead>
<tr>
<th>Indicator</th>
<th>City centre</th>
<th>Beyond city centre</th>
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</thead>
<tbody>
<tr>
<td>11.2.1 convenient access to public transport</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>11.3.1 land consumption</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>11.7.1 Open space for public use</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>11.6.2 Fine particulate matter</td>
<td>High</td>
<td>Low</td>
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</table>
Multiple Criteria are Used to Define the City

......some of which are not compatible

- Slightly more than 50% of countries apply **two or more criteria**
- About 2/3 utilize **an administrative definition** to classify urban areas, but almost all include an additional element *e.g.* **population size, density, economic function etc**
- 49 countries utilize **only population size and density**, number doubles when used in conjunction with other criteria
  - In Bhutan, an urban area should satisfy 4/5 conditions: a) minimum population (1,500), b) minimum population density (1,000 P/km²), c) have non-primary economic activities (>50%), d) surpass set spatial expanse (>1.5 sq. km.) and e) demonstrate economic potential for future growth (revenue base).
  - In Cambodia, urban communes must have population above 2,000 inhabitants with < 50% of male employment in agriculture, and population density > 200  P/km²
- **Actual population thresholds vary** widely –
  - Urban locale in Denmark & Iceland = 200 inhabitants, 20,000 in Netherlands & Nigeria; In Japan, **shi** has a population of 50,000
  - For Chinese authority, minimum density for urban = 1,500 P/Km²; for Germany it is 150P/km²
Different concepts are used to define the city

- **City Proper** – Associated with political/administrative part of city & sometimes the historical centre
  - Limited in actual functional area, affecting statistics *e.g.* Chongqing, China
  - **About 38% of countries** use definition to estimate city data, particularly for non capital cities. *Eg.s* Czech Republic, the Philippines, Korea, Germany, Poland, Russia, Saudi Arabia, Egypt,
  
- **Urban Agglomeration** - “a contiguous territory inhabited at urban density levels without regard to administrative boundaries”.
  - Sometimes combines several urbanized areas, some will less densities
  - **1/3 of city data** estimated using this method; **a further 12% employ it for capital cities**
  - Estimates are higher than where only threshold urban extents are used for same area *e.g.* Hyderabad, India
  - Concept is preferred by the **UN Population Division**.

- **Metropolitan Area** - Associated to a conurbation, which normally represents a densely populated urban core and less-populated surrounding territories – **relative scope**.
  - Often encompass multiple jurisdictions, municipalities, satellite towns, towns and rural areas that are socio-economically tied to the urban core. *E.g.* Nairobi, Kenya
  - **Used by about 5% of countries to estimate city data**, *e.g.s* Australia, Belgium, Italy and Canada; Malaysia, Brazil, Chile, etc apply concept to estimate capital city data
  
- **About 1/5 of countries combine various definitions** to estimate city and population data in their urban areas.

- **Concepts are different in the method of analysis and territorial scale** - which affects population estimates
Different concepts produce different city area, statistics

CITY SIZE (sq.km)
City Core area = 684
Urban Extent = 1,274
Metro. area = 3,200
How are spatial indicators different?

- 7/15 Goal 11 indicators require to be collected at local city level using alternative methods e.g spatial analysis

- Cities do not obey virtual limits/boundaries

- **Functional city** limit is thus different from official one

- Manifestation in space is a true reflection of urban functionality
  - Land consumption
  - Interaction between activities, including use of public open spaces beyond city limits

- Collection of spatial SDG 11 indicators has to adopt spatial-based city definitions
What do the multiple criteria mean?

- **Non-comparability of data** – how to set benchmarks amidst mixed definitions?
- Difficulties **aggregating** data from city/local scales to **national** levels
- Biased **regional and global aggregation & reporting**
- Over/under estimation affecting real decisions, local, regional and international guidelines
- **THUS urgent** need for city definition
Forging a functional city definition

A UN-led process with many stakeholders and steps

Need identified → Extensive study on existing definitions → Expert group meetings to deliberate

Global adoption, mass application

Finalize & present to UNSD/ECOSOC – Mid 2019

Country/city inputs
Experts, partners

Narrow list of definitions & methods

Share, update definitions

More piloting

Pilot definitions

Some actors: UNGGIM, UN-Habitat, EC, OECD, FAO, countries, data users
Forging a functional city definition

• The common agreement
  • Thresholds are a must, whether population or spatial character
  • Better understanding of thresholds equals better definitions/ methods

• Acknowledgement of the UN Population Division preferred definition of Urban Agglomeration, BUT with more “urban threshold” focus

Two (2) candidate definitions
• City as Defined by its degree of urbanization
• City as Defined by its urban extent
City as Defined by its degree of urbanization

- Introduced in the European region in 1991 to indicate character of the area where respondents live. Updated since 2006

The logic

- Population density and contiguity of settlements are key to defining urban-ness of an area
- Unit of measurement is the “Local Administrative Units Level 2 (LAU2)”, comparison challenges
- New DEGURBA disaggregates population into 1Km2 grids – similar comparison unit
The delimitation of city boundaries

- 1 km² grid cells are classified into three clusters, according to their population size and density:
  - **High-density cluster/urban centre**: contiguous grid cells with pop. density of at least 1,500 P/Km², minimum pop. 50,000;
  - **Urban cluster**: cluster of contiguous grid cells of 1 km² with a density of at least 300 inhabitants per km² and a minimum population of 5,000;
  - **Rural grid cell**: grid cell outside high-density clusters and urban clusters.

- LAU2s are then classified into one of three areas:
  - **Densely populated (cities)**: at least 50% of population live in high-density cluster*
  - **Intermediate density area (towns and suburbs)**: < 50% of the population lives in rural grid cells, <50% live in high-density clusters;
  - **Thinly populated area (rural area)**: > 50% of the population lives in rural grid cells.

* LAU2s classified as densely populated if at least 50% live in high-density clusters.
City as Defined by its degree of urbanization

Classification of individual 1 km² grids based on population size and density

Classification of LAU2’s based on character of contiguous surfaces
City as Defined by its urban extent

- Developed by New York University, Lincoln Institute through Atlas of Urban Expansion Project in collaboration with UN-Habitat
- Piloted in 200 cities across the globe

The Logic

- City functioning needs the built up areas and open spaces
- Built-up - contiguous area occupied by buildings and other impervious surfaces
- Open spaces (urbanized) - unbuilt-up areas encompassed within the built up areas or within their immediate vicinity e.g. parks, cleared land, forests, etc
City as Defined by its urban extent

The Concept & thresholds

• A mix of urban-level built-up densities and related open spaces make up the “urban extent”

• Thresholds based on **number of built up pixels** (density of urban-ness) within a walking distance area of 1km2
  - **Urban built-up area**: walking distance circle has a built up density greater than 50%;
  - **Suburban built-up area**: walking distance circle has 25%-50% built up density. It also includes subdivided land, whether it is wholly unbuilt or not; and
  - **Rural built-up area**: pixels where the walking distance circle has a built-up density of less than 25% and that are not on subdivided land.

• Urbanized Open space thresholds
  - **Fringe open space** - all open space pixels within 100 meters of urban or suburban pixels;
  - **Captured open space** - all open space clusters fully surrounded by urban and suburban built-up pixels and the fringe open space pixels around them – area less than 200 ha
  - **Rural open space** – other open spaces

• **Urban Extent** = Urban & sub-urban built up pixels + Fringe & captured open spaces
City as defined by its urban extent

Urban Extent

- Each urban extent section is buffered to 25% of its area
- Sections which intersect with main extent are included into final urban extent
Do the two methods produce similar boundaries?

Black: where urban extent boundaries extend beyond those of DEGURBA

Dark red: areas where the two functional boundaries overlap

Pink: where DEGURBA area is larger than urban extent coverage
Some emerging challenges

• Conflicting interests from organizations/ agencies – each pushing for a particular method

• Length of time to finalize definition – data collection and reporting should have started
  • City

• Implication on **cross-administrative units analysis and reporting**
  • Is this good or bad for informed decision making?

• Misconception on city definition – what to do with current data?
  • Data is relevant, usable
  • There may be some upgrades need, which will impact positively on decisions
Some emerging opportunities

- Cities/countries acknowledge need for practical, globally agreed definition – good for fast adoption and testing
- Agreed definition to help inform globally applicable urbanization guidelines
- Inclusivity in definition – appreciation of varying contexts
- Common definition will generate better National, Regional, Global aggregations

More engagement, mass piloting, quicker decision

Country/City Involvement

Global adoption, mass application, Reporting, Guidelines, Decisions
Conclusion

• Aim is not to change existing administrative and statistical definitions in countries, but to adopt a functional unit for monitoring

• Dynamic and indicator specific city definitions are proposed

• It is the role of National Statistical Agencies and local authorities to collect data and report, so their input is key throughout the process
THANK YOU

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