Localizing Urban SDGs Methodologies
Case Of Tunisia

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أهداف التنمية المستدامة الحضرية ومؤشرات المستوطنات البشرية بتونس
• Political coordination by two Ministries: Development and Foreign affairs
• Civil society, private sector and government stakeholders to be closely associated in SDG’S appropriation
The implementation of SDGs in Tunisia (1)

- Work is under way to constitute Institutional Framework (هيئة وطنية عليا) for SDG’s implementation
- A technical commity for the computation of the SDG’s indicators
- First Voluntary National Evaluation (التقرير الوطني الطوعي الأول حول تنفيذ أهداف التنمية المستدامة) presented in 2019 at the High Level Political Forum (المتدى السياسي الرفيع المستوى)
The goal 11 - Make cities and human settlements inclusive, safe, resilient, and sustainable
Data sources

- National Statistic Institute produce a part of information needed for SDG 11

- Other Statistic data required are produced by Public Statistic Structures

- Civil Society: Specific domains

More than 10 agencies produce indicators for SDG 11
1. Statistique Tunisie
2. Housing, Building and territory management Ministry
3. Transport Ministry
4. Local collectivities Ministry
5. Tunisian Environmental and sustainable Development Observatory
7. Local municipalities
8. .....etc
Collaboration
رصد أهداف التنمية المستدامة الحضرية باستخدام نظم المعلومات الجغرافية.
الخلفيات

المعهد الوطني للإحصاء بصدد تعزيز مناهجه:

- دعم المنتجات الإحصائية ونشرها باستخدام التحاليل الجغرافية المكانية
- تنفيذ الإطار العالمي للمعلومات الإحصائية والمكانية Global Statistical Geospatial Framework

الإنتاج الإحصائي على كل المستويات:

- تجميع – المعالجة – نشر

القيام باختبارات لتحديد أفضل الممارسات في استخدام البيانات الجغرافية المكانية لقياس أهداف التنمية المستدامة.
Using GIS in Monitoring Urban SDGs

The Global Statistical Geospatial Framework

SDG 11’s Indicators with a direct spatial component

11.2.1, 11.3.1, 11.7.1

Transport, Land Consumption, Public Space

Spatial Analysis
- New form of data collection
- New form of analysis
**Indicator 11.3.1:**
Ratio of land consumption rate to population growth rate

**المؤشر 11.3.1:** نسبة معدل استهلاك الأراضي إلى معدل النمو السكاني

**Indicator 11.2.1:**
Proportion of population that has access to public transport

**المؤشر 11.2.1:** نسبة السكان الذين تتوفر لهم وسائل النقل العام المناسبة

**Indicator 11.7.1:**
Average share of the built-up area of cities that is open space for public use

**المؤشر 11.7.1:** متوسط حصة المنطقة السكنية بالمدن التي تمثل فضاء مفتوحا للاستخدام العام

إحصائيات تونس

في طور الإنجاز
We Don’t have a national definition and identification of Cities boundaries YET

• Before, we utilized administrative definition

• Now, Tunisian territory is all communal classified and distinction between urban and rural areas is not feasible according to a well-established definition
Tunisian City boundaries

- Urban SDG indicators are very sensitive to boundaries

  Adapt the “City” definition of EU to the Tunisian case

  Partnership with UN-Habitat and European Union
Use of GIS for City boundaries

WORKING WITH SPATIAL INDICATORS AND DATA

- **Urban agglomeration** is defined as the built-up or densely populated area containing the city proper; suburbs, and continuously settled commuter areas.

- A single large urban agglomeration may comprise of **several cities or towns** and their suburban fringes.

- The delimitation of the urban agglomeration refers to the total **area occupied by the built-up area and its urbanized open space**.
Use of GIS for City boundaries

Urban agglomeration

The term "Urban agglomeration" is used to refer to the built-up, populated area that extends across a continuous field that includes the city itself and its suburbs and the residential areas of commuters who travel to and from it daily.

Commuter areas

This agglomeration can consist of a single large urban area, or several cities and towns as well as its suburbs.

Open space

As well as the urban agglomeration's open spaces, it also includes residential areas of commuters who travel to and from the city daily.
Use of GIS to calculate Indicator 11.2.1

Indicator 11.3.1:
Ratio of land consumption rate to population growth rate

المؤشر 11.3.1:
نسبة معدل استهلاك الأراضي إلى معدل النمو السكاني
**Tunisian Cities Boundaries**

**Data**
- Google Earth/Landsat Imagery (*Censuses* periodicity)

**Method**
Spatial Analysis with GIS tools to define built up areas
Built Up Area

Extract built up areas for each census year

Example of Tozeur City
Functional City Boundaries

Built up areas and city boundaries for each census year

- Tozeur Built up Area 2014
- Tozeur_Urban_Extent_1994
- Tozeur_Urban_Extent_2004
- Tozeur_Urban_Extent_2014
Tunisian Cities Boundaries

Urban Extent Area

مساحة المناطق الحضرية

<table>
<thead>
<tr>
<th>Year</th>
<th>Urban Extent Area (Km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>5.6979</td>
</tr>
<tr>
<td>2004</td>
<td>7.2117</td>
</tr>
<tr>
<td>2014</td>
<td>14.9832</td>
</tr>
</tbody>
</table>

Tozeur

Monastir

1990 2000 2010 2020

Year
City Population

السكان بالتجمع الحضري

احتساب سكان التجمعات الحضرية أو المدن:

- الاعتماد على بيانات التعدادات على مستوى مناطق التعداد الحضري Enumeration Areas
- ربط بيانات التعدادات أو المسوح السكانية بالبيانات المكانية
- التحاليل المكانية لإنتاج الشبكة السكانية Gridded Population
Gridded Population

Data
- **Built up** area at Censuses dates
- **Population at Enumeration Area level** (Censuses)

Result
Population density at each grid cell (1 km²)

Method
- **Distribute** population to habitable land use within each EA
- **Aggregate** (تجميع) population to a grid cell
works-flow to computing SDG 11.3.1
Tunisian Cities Boundaries
Use of GIS to calculate Indicator 11.2.1

Indicator 11.2.1:
Proportion of population that has convenient access to public transport, by sex, age and persons with disability

المؤشر 11.2.1: نسبة السكان الذين تتوفر لهم وسائل النقل العام المناسبة للجميع، بحسب العمر والجنس والأشخاص ذوي الإعاقة
11.2.1 Data and Method

Data and Method

- **Google Earth/LandSat Imagery**
- **Open source/Data collected and georeferenced** by INS
- **Population data at Enumeration Area level** *(Census)*
- **Method based on buffering** distance to create service area of public transport stops

منطقة خدمة وسائل النقل العام
11.2.1 Data and Methods

Processing: Use of GIS software

- **Delimitation** of urban agglomeration or city
- Identification of transport stops
- Computation of service areas: **Buffering** each of the stops at distance field of 500 meter
- **Overlay** service area with population (**Gridded Population**)  
  
- **Calculation** of the population within service areas

\[
\text{Population with access to public transport} = 100 \times \frac{\text{City population}}{\text{Gridded Population}} 
\]
## Service Area of Public Transport Stops

<table>
<thead>
<tr>
<th>Urban Area 2014 (sqkm)</th>
<th>Population 2014</th>
<th>Pop within 500m to bus stop</th>
<th>Total pop with access to public transport</th>
<th>% pop with access to public transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tozeur</td>
<td>8.712</td>
<td>39996</td>
<td>35628</td>
<td>35628</td>
</tr>
</tbody>
</table>

Legend:
- **Bus Station**
- **Circuit Buses**
- **500m Bus Stop Service Area**
Disadvantages

• Methodology does not take barriers into account like crossing closed roads, rivers, railways, etc.
• Street network detained by authorities is not complete, can’t use network to calculate service area using network methodology.
• Lack of transportation data in most cities.
Use of GIS to calculate Indicator 11.7.1

Indicator 11.7.1:
Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities

المؤشر 11.7.1: متوسط حصة المنطقة السكنية بالمدن التي تمثل فضاء مفتوحا للاستخدام العام للجميع، بحسب العمر والجنس والأشخاص ذوي الإعاقة
11.7.1 Data and Method

Data

• Landsat imagery for city boundary

• OpenStreetMap to download streets data in GIS formats

• Google Earth and/or urban plans as a baseline for identification of open public spaces
11.7.1 Data and Method

**Urban Extent**
- Delimit the built-up area of the urban agglomeration

**Land allocated to streets**
- Download Streets from OpenStreetMap
- Computation of total Land allocated to streets

**Public Open spaces**
- Selection of open public space from urban plan and Google Earth
- Computation of total area of open public space

Estimation of share of population with access to open public spaces
## Service area of Public Open Space

<table>
<thead>
<tr>
<th>Urban area 2014 (sqkm)</th>
<th>Land allocated to Streets (sqkm)</th>
<th>Land allocated to OPS (SqKm)</th>
<th>Total land in OPS (sqkm)</th>
<th>Share of Land allocated to open space (%)</th>
<th>Pop within 400m of OPS</th>
<th>% of population with access to OPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tozeur</td>
<td>8.712</td>
<td>1.9547</td>
<td>1.3043</td>
<td>37.4</td>
<td>31566</td>
<td>78.92</td>
</tr>
</tbody>
</table>
Capacity Building for Monitoring and Reporting on SDG 11
The Project support countries to:

- Design monitoring tools to improve availability and access to data at city & urban national levels for systematic reporting over time.
- Create a consistent sample set of cities for national level reporting.
- Strengthen capacities for quality data production, multilevel coordination & inter-linking with SDG 11 and others related with urban components to monitor and report.
UN-Habitat Project: Tunisia

- Selection of two cities: Monastir and Tozeur
- Two Regional workshops conducted two weeks ago in the two cities
- Central and local beneficiaries
- Participants: civil society, government producers of the SDG 11 indicators, observatories, etc
- Training modules
Project

NSI is the UN-Habitat Focal point:

- Coordinate all the relevant stakeholders

1. Consultation with civil society, researchers, ...

2. Collecting Data

3. Reporting

4. SDG 11 Monitoring

5. Calculate the City Prosperity Initiative (CPI) for Monastir and Tozeur cities.
Opportunities 

• **Combining** various methods and data sources

• **Non-traditional** sources (imagery, remote sensing,...) for computing indicators

• **Enhance** the statistical capacities: spatial analysis, Disaggregation and Small Area Estimation methodologies
Moving Forward
التوجهات القريبة

➢ More integration of Statistical and Geospatial information at NSI
➢ Adopt a National definition for Tunisian cities
➢ Finalize methodologies of urban SDGs
➢ Use of alternative data and new technologies: Earth Observations, Big Data,...
Thank you for your Attention

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