Metropolitan and cross-border functionality

Definitions, examples and methodologies for post-2020 programming

14 November 2019
Prague, Czech Republic

Prague Institute of Planning and Development - IPR/CAMP Amphitheatre

REGISTRATION until the 10th November 2019
www.espon.eu/czech-republic
Functional Urban Areas and Regions in Europe: A tool to estimate indicators for functional regions

Katerina Jupova, GISAT
katerina.jupova@gisat.cz
1

About the project
ESPON FUORE
Functional Urban Areas and Regions in Europe

Contractors:

- Universitat Autònoma de Barcelona, ES (lead contractor)
- University of Geneva, CH
- GISAT s.r.o., CZ
- Randbee Consultants, ES
- MCRIT, S.L, ES

Lifetime: October 2018 – April 2020

Observers: Eurostat, OECD
Concept and objectives
From standard reporting units to functional regions as reporting units

Administrative regions

Functional regions
From standard reporting units to functional regions as reporting units

Statistics available? YES

Statistics available? Limited
From standard reporting units to functional regions as reporting units

Administrative regions

Functional regions

Note: Prague’s core, according to the OECD definition, covers the entire area of the city of Prague as well as the nearby municipality of Klánov. Source: OECD (2017b), The governance of land use in the Czech Republic: the case of Prague.
From standard reporting units to functional regions as reporting units

**Statistics available?**

**YES**

Statistics available?

**Limited**

Note: Prague’s core, according to the OECD definition, covers the entire area of the city of Prague as well as the nearby municipality of Kladno.

Concept of the project

- **Statistical data** are usually available at the level of standard statistical units corresponding with administrative units (NUTS, cities, LAU2 etc.)
- Statistical data are **not fully available for functional regions**
- This project aims to **bridge this gap**
- To provide (improve) the **methods allowing to convert/transform (disaggregate) the statistical information from the level of standard statistical (reporting) units to the level of functional regions**
Objectives

1. To **build an updated ESPON OLAP Cube** (ESPON Spatial Multidimensional DB) with all relevant data and indicators

2. to **estimate indicators** for FUAs and other **functional regions**.

3. to **develop a Web Tool** presenting the results and facilitating the **analysis** of the data and **benchmarking** of functional regions
Methodology
From standard reporting units to functional regions as reporting units

What is available for functional regions?

- Information about land cover structure

+ Statistical classification of economic activities (NACE) by LAU
Illustration of the method

- Former ESPON OLAP Cubes, developed within ESPON M4D
Data sources

- **Indicators**: ESPON Base indicators (demography, employment, education, economy, energy, society, R&D, ITS). **At NUTS level**

- **Data integrator**: ER Grid 1 km² for Europe + *Ad hoc* grid for Outermost regions.

- **Ancillary datasets**:
  - European Settlement Map (ESM) 10m (JRC)
  - CLC-R (refined) 100m (JRC) – Land Cover database
  - Statistical classification of economic activities in the European Community (NACE) (ESPON GEOSPECS, from NSI sources)
## Disaggregation/estimation at 1 km\(^2\)

<table>
<thead>
<tr>
<th>Indicator type</th>
<th>ancillary dataset</th>
<th>CLC classes</th>
<th>weights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic, Education, ITS</td>
<td>ESM</td>
<td>Rural, urban, others; class 1</td>
<td>Batista &amp; Poelman 2016</td>
</tr>
<tr>
<td>Employment, Society</td>
<td>NACE total population</td>
<td>Main activity sectors; class 2</td>
<td>Eurostat</td>
</tr>
<tr>
<td>Economy, R&amp;D</td>
<td>NACE by type of activity</td>
<td>Main activity sectors; class 2</td>
<td>OCDE</td>
</tr>
<tr>
<td>Energy</td>
<td>NACE by type of activity</td>
<td>Main activity sectors, Eurostat, GHG emissions; class 2 and 3, respectively</td>
<td>EEA Report No 8/2017; Eurostats</td>
</tr>
</tbody>
</table>
Technical background

- **Automated** procedures developed (scripts).
- Spatial Multidimensional **Database** set up.
- Most of indicators already **estimated**.
- Results currently under **validation**.
Selected functional regions
Selection of functional regions (criteria)

- **Type of region**: the region is not a simple aggregation of NUTS, but a territory based on geographical, socio-economic and/or functional relationships.

- **Coverage**: at least 28 countries of the 28+4 that compose the ESPON space are covered in a consistent manner.

- **Delineation**: clear geometries (ideally based on EBM LAU units) are available and the delineation methodology can be consistently applied over the ESPON space.
Nine functional regions

- TERCET Functional Urban Areas (FUA)
- TERCET Coasts
- Eurostat’s Maritime Service Areas (MSA) Coasts
- Mountains
- Islands
- Sparsely Populated Areas (SPA)
- Border “narrow” (45 min)
- Border “large” (90 min)
- Green Infrastructure potential areas

ESPON GEOSPECS

ESPON GRETA
TERCET FUA

Functional urban areas - reporting units

Regional level aggregation of LAUs (version Census 2011)
Source: ESPON FUORES, 2019
Origin of data: Eurostat - TERCET.
Eurostat’s MSA

MSA coasts - reporting units

Regional level aggregation of LAUs (version Census 2011)
Source: ESPON FUORES, 2019
Origin of data: EUROSTAT - Maritime service areas

© ESPO, 2019
Islands - reporting units

Regional level: aggregation of LAUs (version Census 2011)
Source: ESPON FUORES, 2019

Origin of data: ESPON ETMS-GEOSPECS, Originals from GEOSPECS 2012, double checked in ETMS 2014
© BY-SA University of Geneva for administrative boundaries
Border areas "narrow"
Border areas “large”
Green Infrastructure

Green infrastructure - reporting units

Regional level aggregation of LAUs (version Census 2011)
Source: ESPON FUORE, 2019
Origin of data: ESPON GRETA

© ESPON, 2019

500 km
The web tool

http://fuore.eu/
ESPON FUORE web tool (http://fuore.eu/)

- One of the **main results** of the project.
- Presents the indicators disaggregated at the level of functional regions.
- **Interactive** web tool of interlinked **maps** and **charts**, allowing the users **analysis** and benchmarking of functional regions.
- Currently in its **beta (draft final) version**. **Final version in April 2020.**
- **Open source components based** – no additional licenses needed.
Main features of the web tool

http://fuore.eu/
Landing page

- Info about the project
- Selection of functional region of interest
- Link to ESPON project website
- Guidelines on how to use the tool will be added
- Link to Web Analytical Toolbox (for user-driven disaggregation of indicators)
Selection of indicator

- Categories and sub-categories
- Cartographic visualisation depends on the type of indicator (stock values x ratios)
The Web Map View

- Interactive map window + interactive charts - fully synchronized
The Web Map View

- Interactive map window + interactive charts - fully synchronized

Selection of functional region
Selection of indicator
Interactive charts

Interactive map

Status chart
Column bar

Time-axis

Time-series
Line chart
Map options

- Dot chart for stocks
- Choropleth map for ratios

- Different types of background map are available (aerial, topographic, etc.)

- Querying analytical units in the map
Interactive charts

- Charts showing the values in cumulative way (groups, maxima, averages) or unit by unit
- Reporting units sorted in descending way by default
Benchmarking, identification of „similar“ regions

- Select the unit in map window
- Select the unit in chart

- Regions with similar values are highlighted
Multi-temporal mode

Filtering Regions

- Filtering based on combination of country and values of indicator
Exporting Functionalities

- Maps, charts and data content can be exported as PNG, GIS layers or tabular data.
The data content of the Web Tool is easily updatable.
Data content of the Web Tool can be easily updated or extended

- Data can be:
  - Added
  - Updated
  - Deleted
- New types of functional regions can be added
- New indicators can be added
- New years can be added
User-driven disaggregation
User-driven disaggregation

- Allows the user to disaggregate his own indicators and visualise them in the interactive web tool.
Scheme of the disaggregation process used in the „Web Data Analysis Toolbox“

You can parametrise your disaggregation

A user-friendly GUI will be provided

And quickly check the result
And then upload your result into the Web Tool

- The user can display and interactively analyse the disaggregated indicator(s) in the interactive Web Tool
The project website:

// https://www.espon.eu/functional-urban-areas-tool

The Web Tool:

// http://fuore.eu
Thank you

Katerina Jupova, GISAT

katerina.jupova@gisat.cz

This presentation will be made available at: www.espon.eu/czech-republic