INSTITUTO FEDERAL DE TELECOMUNICACIONES

Assessment and Evaluation of Meaningful Connectivity

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Spectrum Unit

Digital divide

In order to promote a more equal and equitable world, the existence of a digital divide is not acceptable.

Closing the digital divide means much more than getting everyone online.

Author: Cuartoscuro

Universal and Meaningful Connectivity

“Telecommunication is not an end itself”. Connectivity must be “for the people”.

Universal and **meaningful connectivity** is the possibility for everyone to enjoy a safe, satisfying, enriching, productive and affordable online experience

Author: ELMUNDO

Measuring the Connectivity

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To measure the “meaningful connectivity” in a certain area, a multidimensional analysis is required:

Dimension	Description	Variables
Technological	Coverage and Quality of Service (QoS)	Zones with coverage, throughput, latency and jitter
Economic	Economic development	Investment, income and expenses, production of goods and services between others
Population	Access to social security and social mobility	Migration, level of employment and access to medical services
Housing	Housing quality	Access to basic services and goods

Our approach

Radio Spectrum Unit

Mathematical techniques

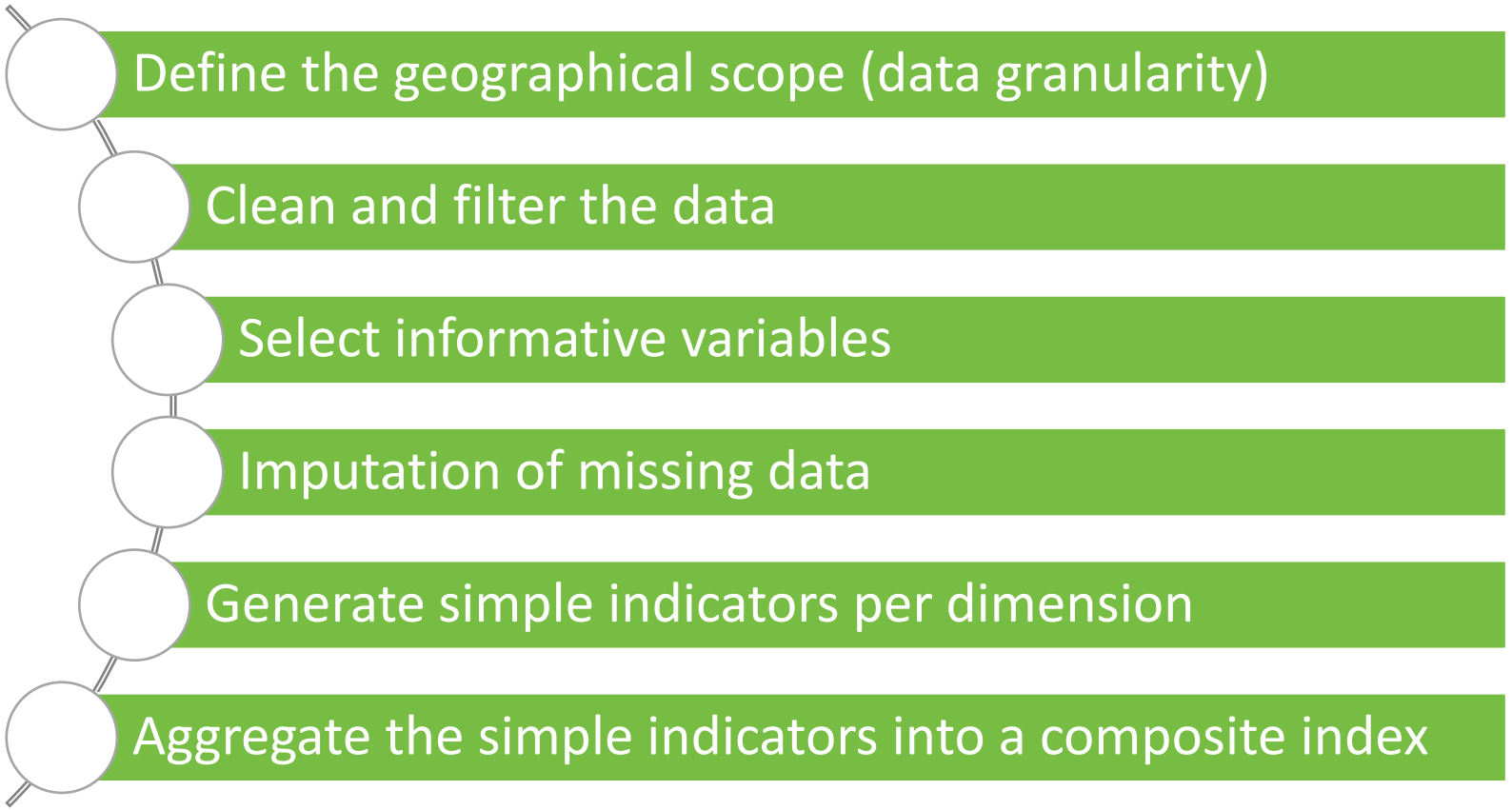
Single numerical value

Connectivity Index

Allows comparison

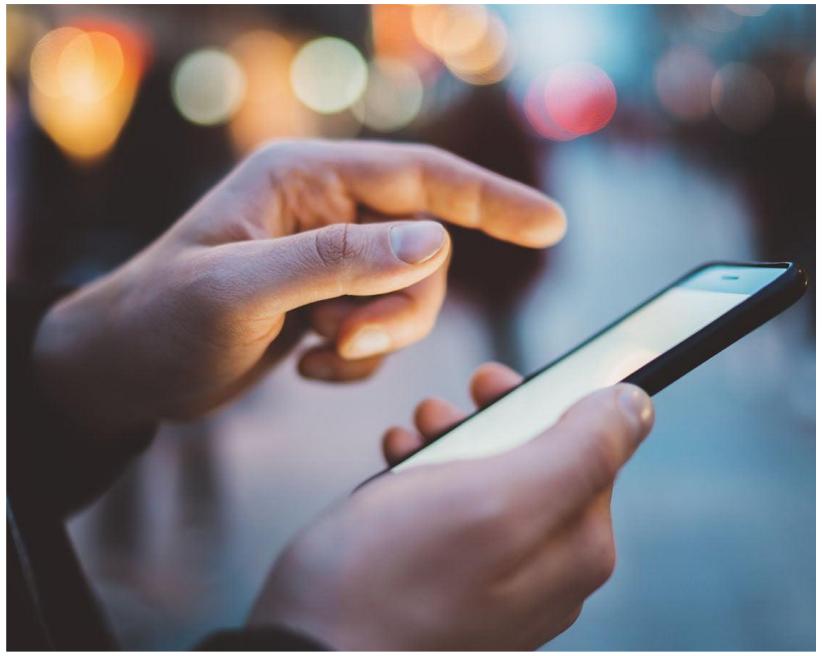
Our Methodology

The applied methodology is as follows:



Information sources

The quality of the data is key



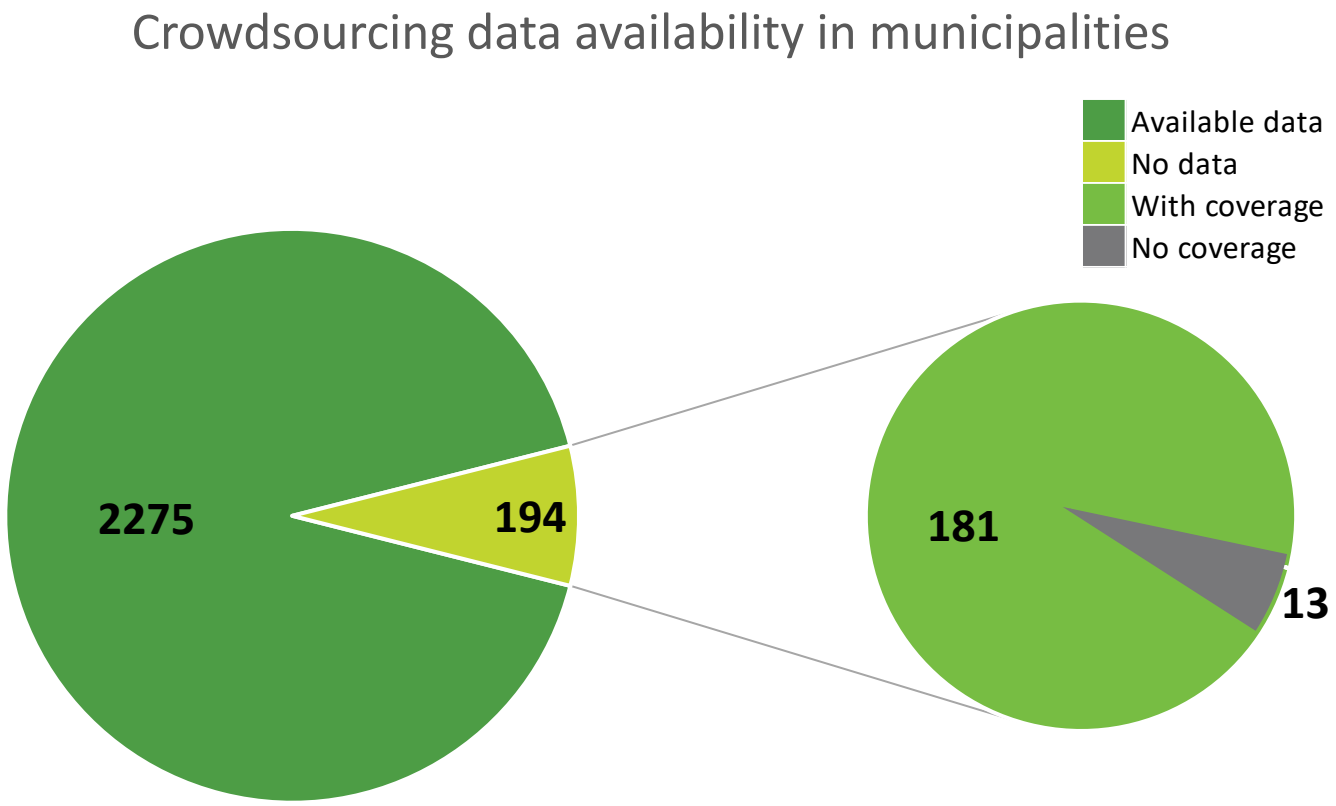
Crowdsourcing consumer initiated tests from July 2022 to March 2023

INEGI

Economic census of 2019 and census of population and housing 2020

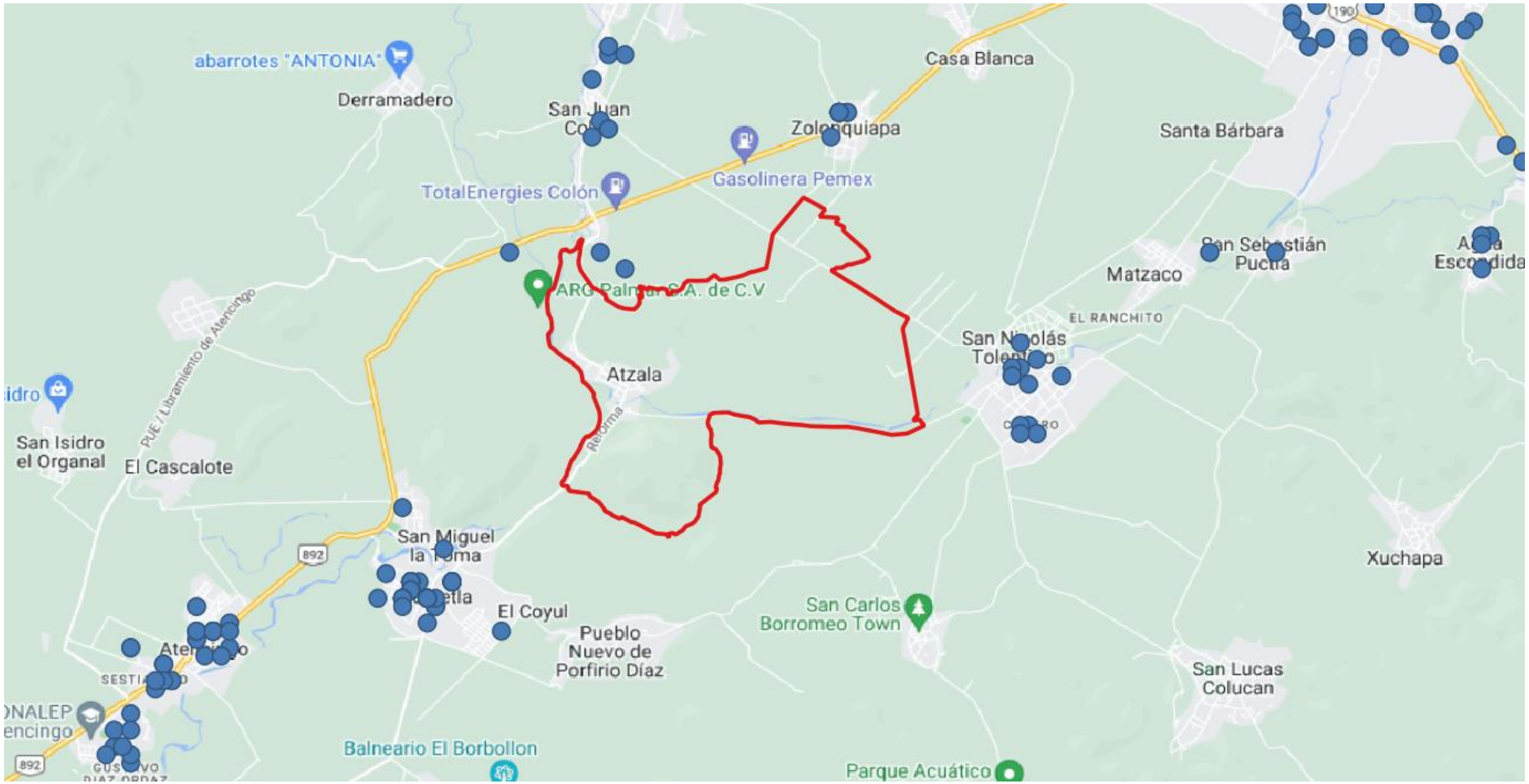
Geographical scope

The analysis compares municipalities in Mexico. We analyzed a total of 2,469 municipalities.



Imputation of missing data

Hypothesis: observations close to each other tend to be more alike than those further apart.



Simple indicator

The mathematical problem consists in find the coefficients that capture the amount of information that each variable contains.

$$ind\_tec = \alpha_1 * downloadMbps + \alpha_2 * uploadMbps + \alpha_3 * latency + \alpha_4 * jitter$$

The following open source tools were used:

Connectivity Index

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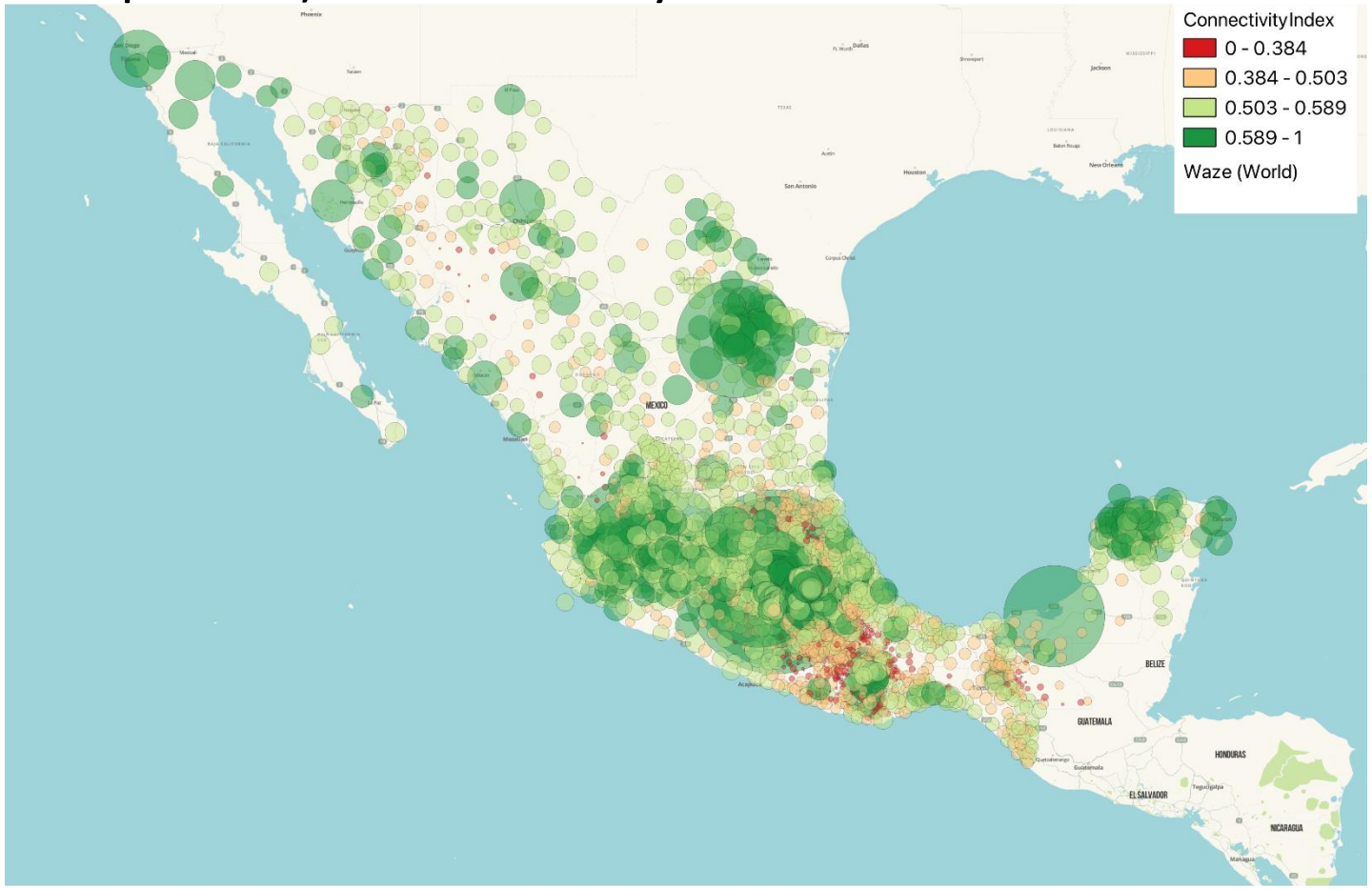
We developed a methodology to obtain a municipality connectivity index using census information together with crowdsourcing data to compare the meaningful connectivity of different zones (municipalities) in the country.



Connectivity Index in Mexico City

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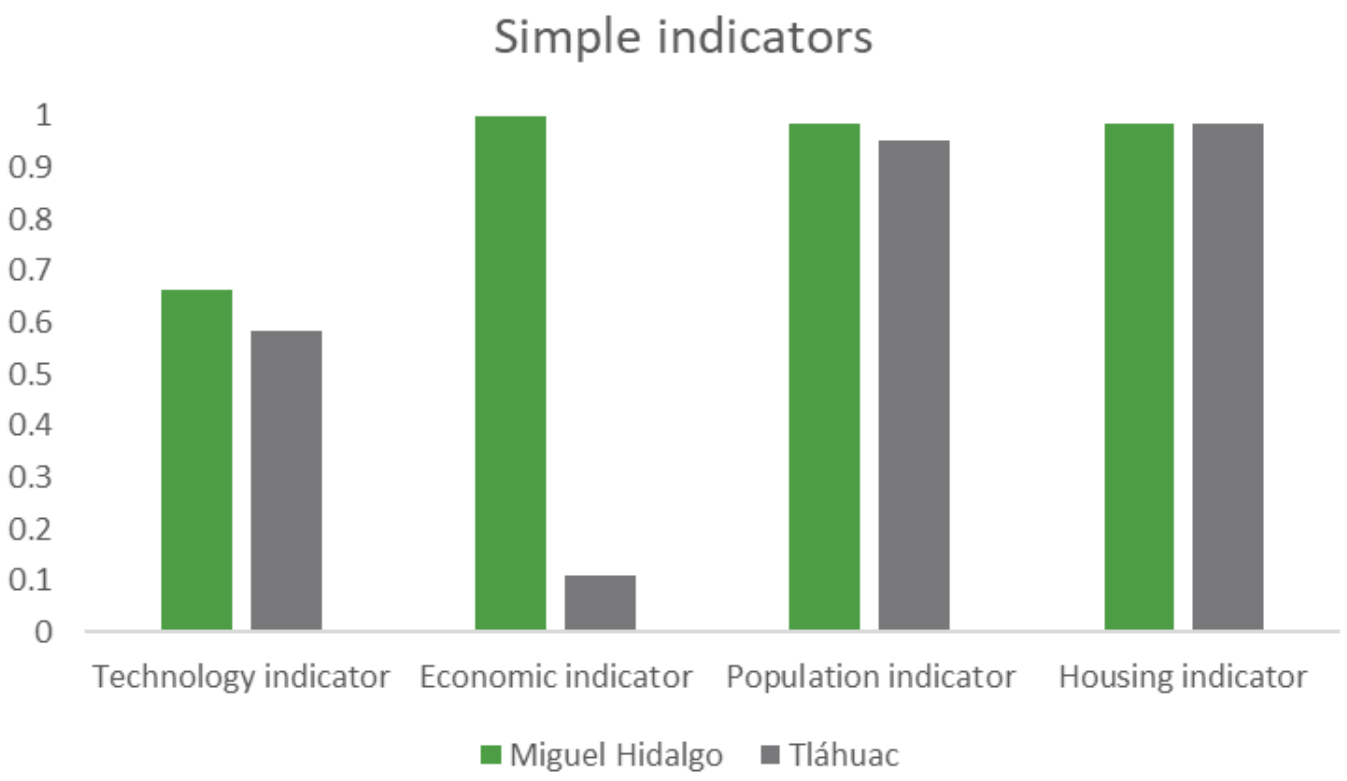
We can observe differences between zones of the same group. For example, in the dark green group Tláhuac has a score of 0.604 against the score of 1 of Miguel Hidalgo.

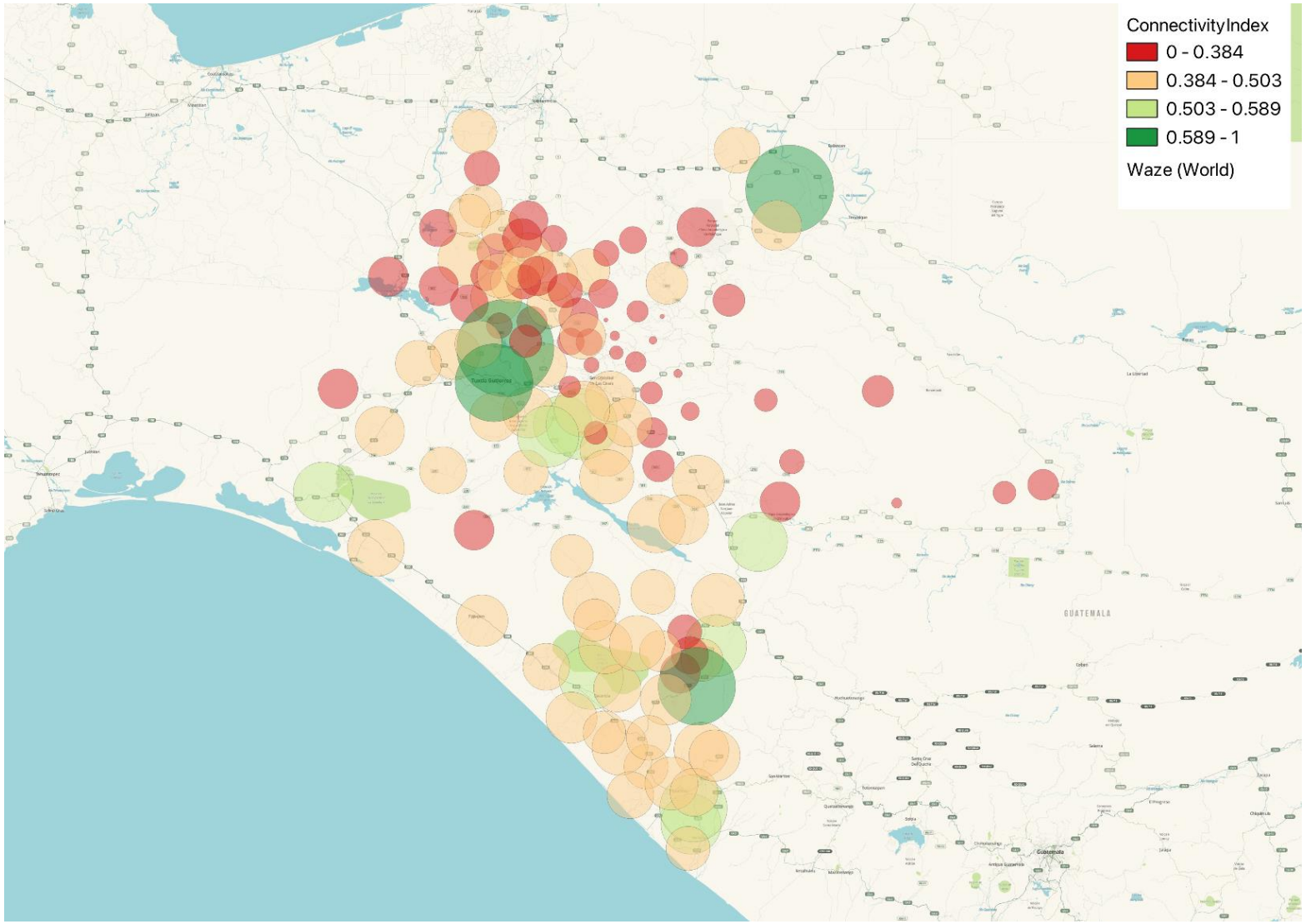
Comparing simple indicators



The main difference is the economic dimension

Connectivity Index in rural areas

In states where most of their population is rural, we can observe more contrast between zones.



Use cases

¿How can we use this analysis to close the digital divide?

- Implement targeted public policies
- Create incentives for operators in the low score zones
- Identify potential investment areas
- Track the progress of connectivity programs

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Thank you for your attention!

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