# Exploratory Spatial Data Analysis of E-Government and E-Participation across Africa using SDMX data

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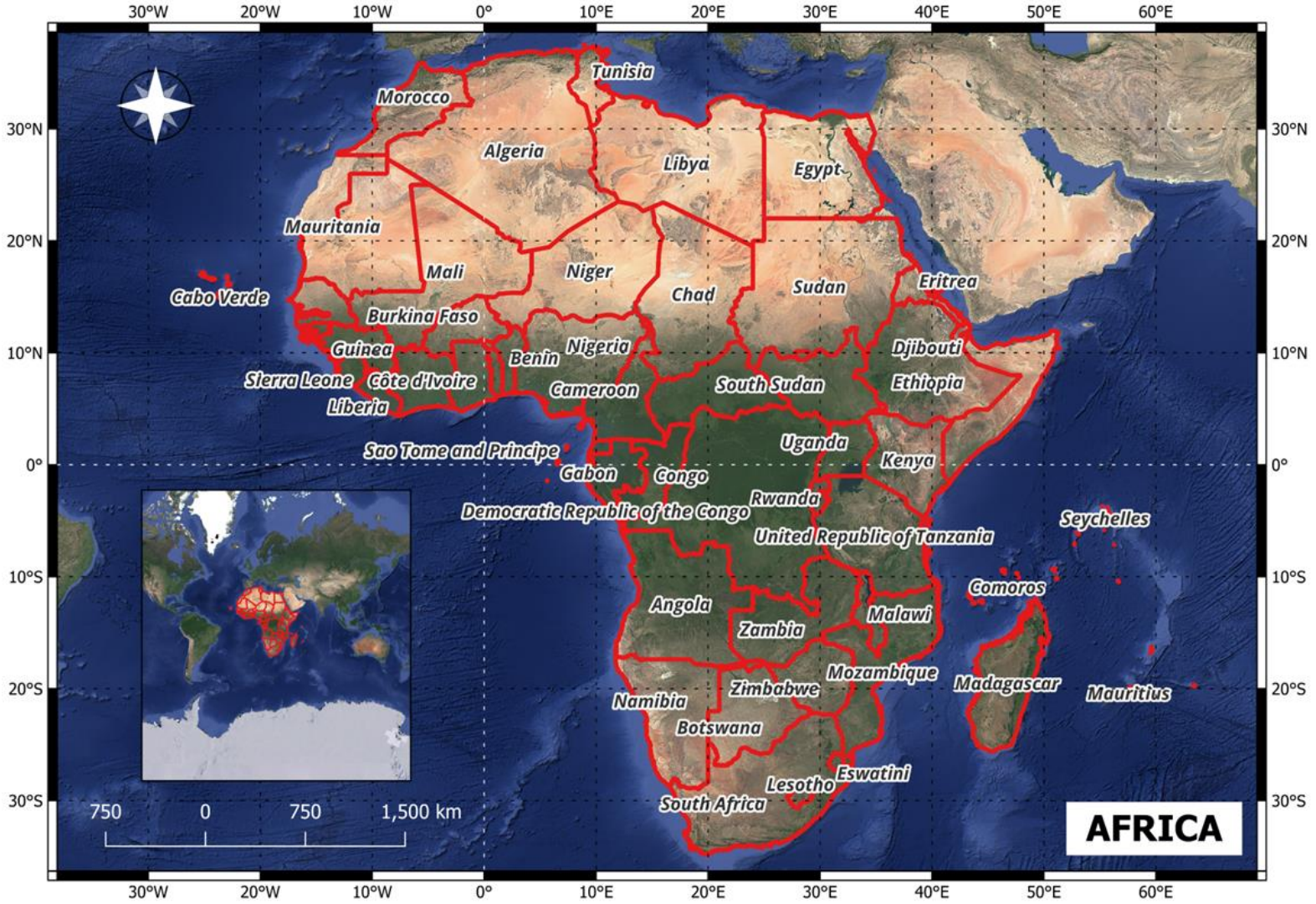
# Background

- Socio-economic digitalization significantly contributes to Sustainable Development.
- However, the digital divide remains a barrier to equitable progress toward the SDGs.
- Targeted interventions in the evolving digital economy are critical for reducing inequalities (SDG10) and partnership for the goals (SDG17) digitalization is a major driving factor of globalization.
- This study combined SDMX Data (statistics) with GIS Data (Geography) for Actionable insights on the digital divide across Africa.

# Study Area


30°W
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Tunisia
Morocco
Algeria
Libya
Egypt
Mauritania
Mali
Niger
Chad
Sudan
Eritrea
Cabo Verde
Burkina Faso
Guinea
Nigeria
Benin
Djibouti
Sierra Leone
Côte d'Ivoire
Cameroon
South Sudan
Ethiopia
Liberia
Uganda
Sao Tome and Principe
Kenya
Gabon
Congo
Rwanda
Democratic Republic of the Congo
United Republic of Tanzania
Seychelles
Comoros
Angola
Malawi
Zambia
Mozambique
Madagascar
Mauritius
Zimbabwe
Namibia
Botswana
Eswatini
Lesotho
South Africa
750
0
750
1,500 km
AFRICA

# SDMX

- SDMX (Statistical Data and Metadata eXchange) being the global language for official statistics
- It provides a standardized framework for describing and sharing statistical data and its metadata
- In this presentation SDMX is leveraged for Exploratory Spatial Data Analysis of E-Government and E-Participation across Africa
- While pre-packaged SDMX datasets (not live APIs) were used, SDMX's standardized structure meant or means:

1. Easy integration and interoperability with various tools and technologies (QGIS, GeoDa, Google Maps) eliminating data harmonization barriers
2. Scalability and reproducibility since one can repeat the same workflow for many indicators or countries.
3. Repeatability as new SDMX releases come out

# SDMX enabling Spatial Analysis

1. UN E-Government and E-Participation Data uses SDMX standards across all 54 African Countries for cross-country comparability, critical for continental analysis:

   **'SURVEY_YEAR + COUNTRY_NAME + E-GOVERNMENT_INDEX + E-PARTICIPATION_INDEX+…'**

2. Implemented ATTRIBUTE JOIN between the SDMX data and ICPAC shapefiles using `COUNTRY` dimension (rather than manual cleaning)

3. Used the SDMX –derived values to map policy-relevant patterns and conduct Exploratory Spatial Data Analysis (ESDA)

# Exploratory Spatial Data Analysis (ESDA)

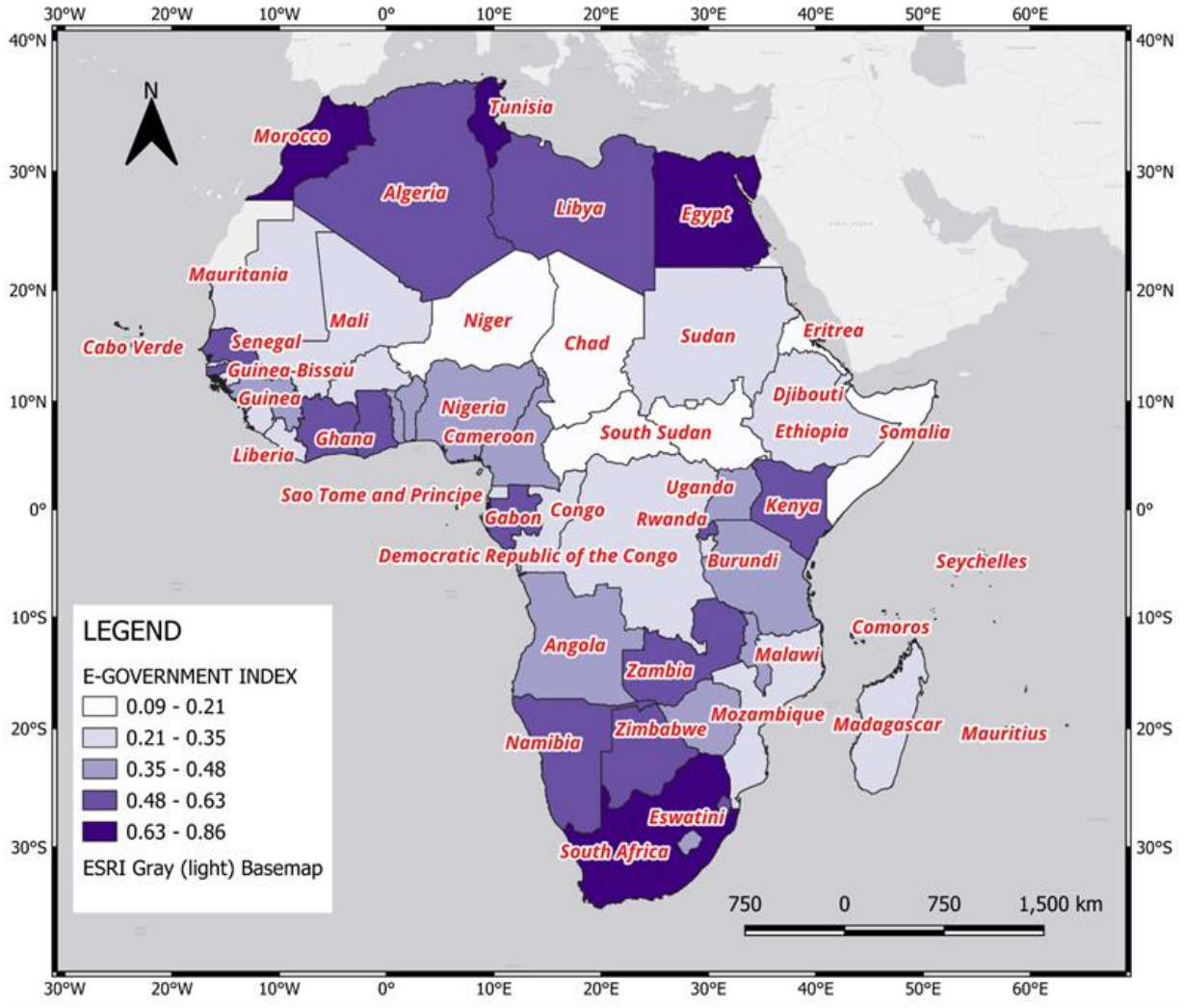
- ESDA is a crucial set of techniques used to describe and visualize spatial (geographic) distributions
- It unveils patterns and disparities across space that might not be immediately obvious.
- ESDA techniques implemented:
- Choropleth Mapping
- Univariate and Bivariate Global Moran's I
- Univariate and Bivariate Local Moran's I

Check Annex

# E-Government Index

Lower Quantile Countries or Territories: Western Sahara, Central African Republic, South Sudan, Somalia, Eritrea, Chad, Niger, Burundi, Liberia, Gambia

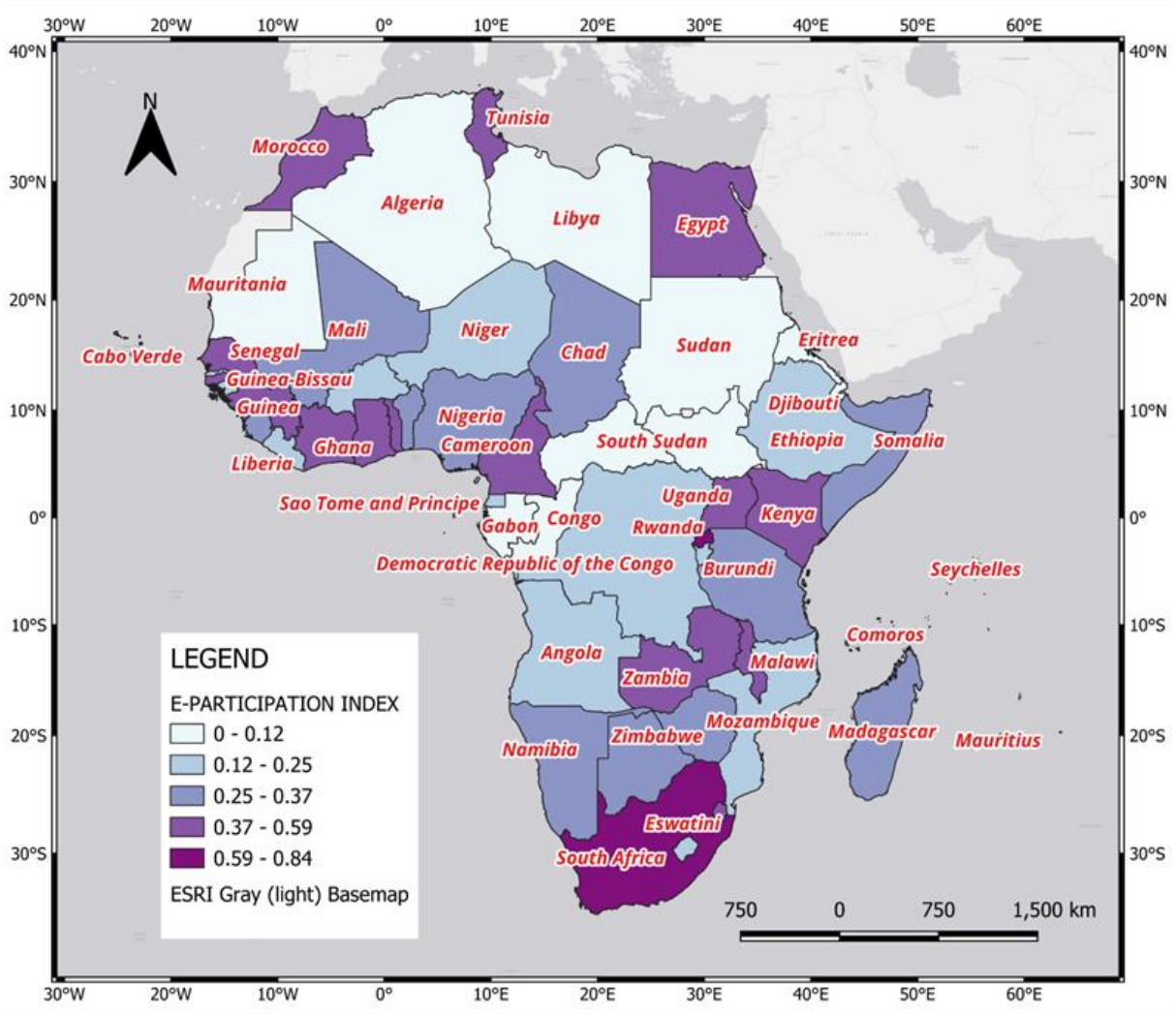
Upper Quantile Countries or Territories: South Africa, Mauritius, Tunisia, Morocco, Seychelles, Egypt, Ghana, Kenya, Cabo Verde, Botswana, Eswatini



# E-Participation Index

Lower Quantile Countries or Territories: Western Sahara, Comoros, Libya, Eritrea, Algeria, Sudan, Congo, Central African Republic, Djibouti, South Sudan, Gabon

Upper Quantile Countries or Territories: South Africa, Rwanda, Egypt, Cabo Verde, Ghana, Kenya, Guinea, Tunisia, Togo, Malawi, Morocco



# Conclusion

Adopting SDMX is not just about data exchange; it is about making data actionable.

SDMX is the essential first step toward using advanced analytical techniques such as ESDA to create evidence-based policies for e-governance in Africa.

Therefore, SDMX-compliant data portals should include geospatial information and GIS practitioners should actively advocate for the use of SDMX standards.

# The End

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Thank You For Your Attention!

Any Questions?