**Example of Methodology for Identifying Suitable Agricultural Areas Based on Land Surface Temperature and Land Use Constraints**

**1. Selection of Suitable Temperature Zones**

* Filter geographic areas where the average temperature falls within the range of **7–12°C**.

**2. Identification of Urban Clusters**

* Use the **Urban Clusters dataset** from Eurostat GISCO ([link](https://ec.europa.eu/eurostat/web/gisco/geodata/population-distribution/clusters)).
* Extract and map all urban clusters.

**3. Creation of 3 km Buffers Around Urban Clusters**

* Generate a **3 km buffer zone** around each identified urban cluster to delineate areas influenced by urban expansion.

**4. Extraction of Relevant OpenStreetMap Layers**

* Retrieve and filter the following layers from OpenStreetMap:
  + **Water Bodies**
  + **Land Use** (Filter: 'fclass' IN ('commercial', 'cemetery', 'forest', 'heath', 'industrial', 'military', 'park', 'residential', 'retail'))
  + **Roads** (Filter: 'fclass' IN ('motorway', 'motorway\_link', 'pedestrian', 'trunk', 'trunk\_link', 'primary', 'primary\_link'))
  + **Railways**

**5. Creation of 10m Buffers Around Roads and Railways**

* Apply a **10-meter buffer** around all selected roads and railways to account for infrastructure influence.

**6. Identification of Non-Agricultural Areas**

* Merge the following layers to define areas **unsuitable for agriculture**:
  + **Urban cluster buffer zones (3 km)**
  + **Water bodies**
  + **Selected land use categories**
  + **Road and railway buffers (10 m)**
* The resulting dataset represents **areas where agricultural activity is highly restricted or unfeasible**.

**7. Removal of Non-Agricultural Areas from Suitable Temperature Zones**

* Subtract the non-agricultural areas (Step 6) from the initially selected suitable temperature zones (Step 1).

**8. Calculation of Percentage of Suitable Areas by Administrative Unit**

* Overlay the final suitable agricultural areas with administrative boundaries.
* Calculate the **percentage of suitable land** within each administrative unit.
* Store and present the results in tabular and spatial formats for further analysis.

**Example of Calculation of the Location Suitability Quotient**

* Compute the **ratio of suitable agricultural area to the total area** within each administrative unit:

Where:

* LQ = location quotient
* = area of suitable agricultural land in the administrative unit
* = total area of the administrative unit
* = total suitable agricultural land in Lithuania and Poland
* = total analysed area in Lithuania and Poland

**Interpretation of the Local Suitability Coefficient**

* If LQ = 1 → The share of suitable land in this administrative unit is equal to the average share in the analysed region (Lithuania and Poland).
* If LQ > 1 → This unit has a higher proportion of suitable agricultural land compared to the regional average, indicating a more favorable environment.
* If LQ < 1 → This unit has a lower proportion of suitable agricultural land, suggesting it is less suitable for agricultural activities.

**Data Sources and Software**

The analysis was conducted using **only openly accessible data and open-source software**.

The datasets used in this analysis are accessible at the **European level**, ensuring consistency and comparability across different regions.

The following datasets were used:

* OpenStreetMap (for land use, roads, railways, and water bodies)
* Urban Clusters dataset from Eurostat GISCO (for urban clusters removal)
* Simplemaps.com (for additional geographic data)