SUPPLEMENTARY MATERIAL

Appendix 1. R functions used for data import and initial exploration. Source: own elaboration.

Function	Purpose	Details
read_excel (_)	Load Excel file into R	This function enables the import of Excel files into R, converting them into datasets within the software
names (_)	Check column names in dataframes	This function checks the names displayed at the top of each column in a dataframe
summary (_)	Display data summary	Generates a summary of different objects, providing basic descriptive statistics for each variable in the dataset, including minimum, maximum, first and third quartiles, median, and mean
dim (_)	Check number of rows and columns	This function identifies the number of rows and columns in a dataframe
class (_)	Check object classes in dataframes	This function returns the type or class of objects created in R, as well as their structure (e.g., table, matrix, or dataframe)

Caption: Functions employed to import data from Access 365 into R® and to conduct preliminary analyses of the datasets.

Appendix 2. Functions for raster data loading and spatial object transformations. Source: own elaboration.

Function	Purpose	Details
plot (_)	Visualize spatial objects	Displays raster or vector data graphically for visual inspection and exploratory analysis
st_as_sf (_)	Convert to sf object	Converts an st object (tabular dataset) into an sf object (simple features collection)
as (_, "spatial")	Convert to sp object	Converts an st object (tabular dataset) into an sp object (spatial data object)
filter (_)	Filter data	Used to filter a dataset for specific information; descriptors may correspond to names or values depending on the variable being analyzed
ncell (_)	Identify number of cells in the dataset	Identifies the number of cells in a dataframe, i.e., returns the total number of rows in the dataset
crs (_)	Identify the geographic coordinate system associated with the data	When applied to a spatial dataset, this function identifies the geographic coordinate reference system used by the data producer

Caption: Functions employed to load shapefile data and conduct spatial object transformations.

Appendix 3. Overview of join()-based functions for combining dataframes. Source: own elaboration.

Function	Specification
Left_join (_)	Combines two datasets A and B, where A is used as the guide for the merge. If A > B, all rows of A are retained and rows of B without matches are added. If A < B, all rows of B without matches in A are added to the new dataset.
Inner_join (_)	In the merge between datasets A and B, only rows with matches between A and B are retained; all other rows are excluded from the new dataset.
Right_join (_)	In the merge between datasets A and B, B guides the data merge. If A > B, values in A without matches in B are excluded from the new dataset. If A < B, values in B are repeated for A according to the matching rules.
Full_join (_)	In the merge of A and B, all data are included in the new dataset. Elements with matches between A and B are combined, and those without matches are retained even without correspondence.
Anti_join (_)	In the merge between A and B, only rows without matches between the datasets are retained. In other words, data with matches between A and B are excluded.

Caption: Table presenting the functions derived from join(), which are used to merge different dataframes.