Instituto Superior de Agronomia

M.Sc. Green Data Science - Geographic Information Systems

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**Assignment Report**

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**Problem 1 – Determine the regions vulnerable to flood risk due to river overflow during the raining season**

The first step was to create a raster layer with the elevation information and the given coordinates. For the first part of the problem, the relevant features to were identified (elevation equals or less than 17 meters) and converted to vector. In this new vector layer, only the feature where “elevation=1” were selected because it is our region of interest. Final step was to calculate the total area.

The same workflow was used for the second part of the problem. In this case, we classified the elevation into 3 numerical categories (1 – high risk; 2 – moderate risk; 3 – low risk), and dissolved the “risk” field, at the end, to calculate the total area of each level of risk.

NOTE: Because of the used coordinates, there were some features (in the upper felt corner of the polygon) that were not of interest for the study case. Those were deleted by selecting the features and hitting “delete selected features”.

**Problem 2 – Classify parcels by their soil use.**

**Problem 3 – Classify all the parcels of the Region by their soil use and owner**

To do this classification, we identified the owners for each parcel where the soil use was classified, according to table SoilUse. The cadastre area for which the soil use was not classified for, was isolated and, later, identified as having “Other” soil use. Finally, the parcel from problem 2 was added, making the classification of soil use and its owners complete.

Lastly, the total land area of each owner was calculated, by removing the boundaries based on “NId” field. This operation was repeated to calculate the total land area per soil use, removing the boundaries based on “SoilUseCod” field.

To represent only the agriculture and forest regions, we isolated both layers with the respective soil uses and updated the attribute table were the “SoilUse” field was classified as ‘A’ and ‘F’, respectively. These two layers were later merged together.

**Problem 4 – Represent the relative index of susceptibility to groundwater pollution of the region**

The strategy used to solve this problem was to join all relevant attributes in one vector layer, in order to calculate the index of susceptibility (IIpp), and label it.

Two csv tables were created – lluu\_values and lltt\_values -, based on table 1 and 2. Because these values are dependent on the type and use of the soil, respectively, they were joined in the same table, as showed in diagram 3.

To represent the locations were IIpp is greater than 3, and their owners, the selected feature were exported to a new vector file. Due to previous steps, this layer has already the “NId” attribute.

**Problem 5 – Comparing the rice production in Southeastern Asia for the years 2010 and 2020**

Data downloaded: 2 tables (one for 2020 and another for 2010) with the following columns: Domain; Domain code; Area; Area code; Element; Element code; Item; Item code; Year; Year code; Source; Source code; Unit; Value; Flag; Flag description; Note

Data used: 2 tables + gds vector GlobalAdmCountriesWGS84 used for exercise 6 about CRS

First step was to normalize the tables to remove any dependencies, so we ended up with nine different tables, for each.

* Domain (domain\_code; domain)
* Area (area\_code; area)
* Element (element\_code; element)
* Item (item\_code; item)
* Year (year\_code; year)
* Source (source\_code; source)
* Unit (unit)
* Flag (flag; flag\_description)
* Production (domain\_code; area\_code; item\_code; year\_code; source\_code; element\_code; unit; values; flag)

\*show tables\*

Match the counties names?? Manually?

Join value field and rename them according to year

Create symbology with diagram