

# STUDIES ON SUBSTANTIATING THE SUSTAINABLE RURAL DEVELOPMENT PROGRAMS FOR THE CRIȘURI HYDROGRAPHIC BASINS, BIHOR COUNTY

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**Abstract.** Rural development in Crișuri hydrographic basins, Bihor County. The study presents situation regarding the characteristics of natural factors and the effects over development rural activities. This scientific paper to refer of the researches for PhD Thesis, elaborated in the POSDRU Program, nr.107/1.5/5/76888.

**Keywords:** rural development, hydrographic basins, socio-economic development

## INTRODUCTION

The socio-economic development of a territory depends upon the natural resources that it provides for use according to the requirements imposed by the developmental process shaped into general and sectoral policies and strategies at local, zonal or regional level.

Any strategy for socio-economic development must be based on the assessment of the natural resources that should be turned into good account in a sustainable manner. In order to achieve the highest effect with lowest consumption, the resources should be differentiated according to category and exploitation limits.

The natural potential of a territory is defined by the complex resources constituting the environment and can be analyzed based on the amount and specificity of each particular constituent.

Thus, distinction can be made between the primary natural potential and the secondary natural potential, where the former reflects the expression of the environmental factors that are not influenced by contemporary human intervention. The primary natural potential consists in the basic elements that determine the formation and evolution of the environment.

## MATERIAL AND METHOD

### 1. Location

The area under study is located in the North-West Development Area (Fig. 1) which includes six counties, as follows: Bihor, Bistrița-Năsăud, Cluj, Maramureș, Satu-Mare, Sălaj. The North-West Development Area consists of 421 local administrative units: 6 counties, 42 cities and towns (of which 15 cities) and 399 communes. There are 1,844 human settlements in total (5).

Concerning its cross-borders, the area under study is partly included in the Bihor-Hajdú-Bihar Euroregion, established by the Bihor County Council and the Hajdú-Bihar Self-government in October 2002. The city of Oradea and the Debrecen Self-government joined the Establishment Agreement. The general objectives of the Euroregion are aimed at maintaining and developing good-neighborly relations, and at identifying the potential areas of cross-border cooperation.

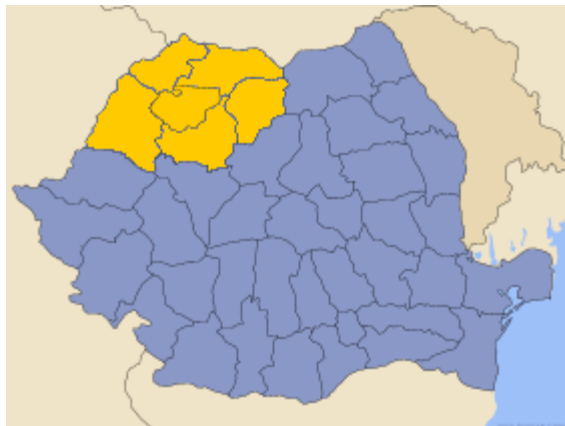


Fig. 1. North-West development area

## 2. Climate characteristics

Fig. 2 presents an overall evaluation of the climate conditions of the Crișurilor Country. It is noted that there is an oceanic climate in the entire study area, differentiated according to the relief forms, i.e. plain, hills and low-mountains plateaus. Several climate subregions can be identified: 1-the Banato- Crișan Plain, 4-the Banato-Crișan Hills, and 9-the Western Carpathians.

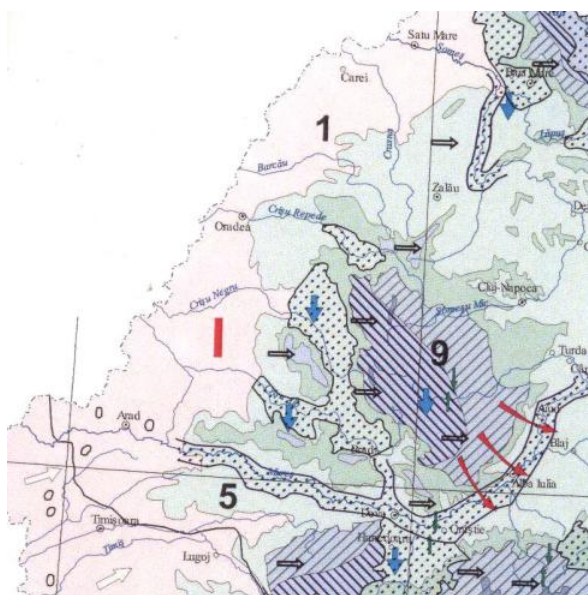


Fig. 2. Climate regionalization of the study area (1)

Geographic location and relief layout result in the particular characteristics of the climate. The area under study is defined by the oceanic temperate climate from western and Mediterranean climate from southern and southwestern Europe. (4)

The Crișuri hydrographic basin presents great variability of surface deposit types (Fig. 3). Thus, the following are present from the border with the Republic of Hungary:

Holocene alluvia – gravels, sands, clays (1), wind sands in four sites (3), deluvio-coluvial and proluvial sandy-clayey glacial deposits, associated with terrace deposits (7), eluvio-deluvial deposits formed on neogenic volcanic rocks (3).

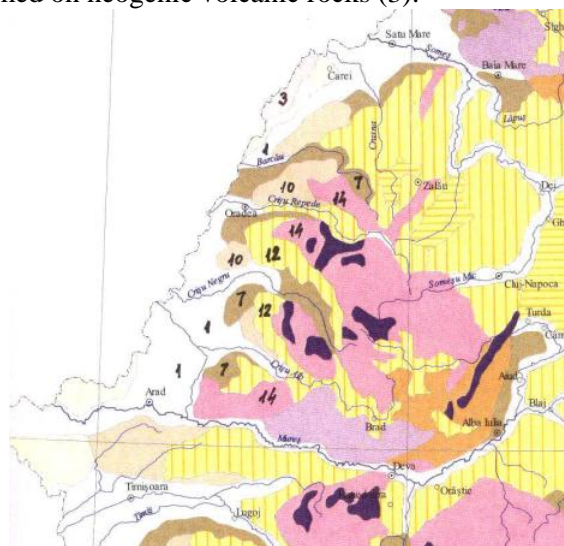


Fig. 3. Surface deposits in the Crișuri hydrographic basin (1)

### 3. Soil characteristics

Bihor County has great variety of soils ranging from chernozems in the West to alluvial soils on river floodplains and erodisols in the mountain area. Soil quality shows a predominance of agricultural lands, included in classes III and IV (Table 1), which points to the necessity of permanent and intensive improvement interventions destined to ensure high productivity.

Table 1

Land distribution (ha) according to use categories in North-West Region 6  
(2)

County	Total county area	Total Agricultural area	Arable	Pasture and hay	Vineyards	Orchards
Cluj	667 440	424 552	178 405	241 638	340	4 169
Bihor	754 427	449 452	303 098	181 139	5 182	10 083
Bistrița-Năsăud	535 520	297 096	100 781	186 864	398	9 053
Maramureș	630 436	311 177	84 009	220 784	230	6 154
Satu-Mare	441 785	317 500	221 3161	84 083	4 037	8 064
Sălaj	386 438	239 945	121381	112 692	1 832	4 040
NW Region 6	3416046	2 089 702	1008 990	1027 200	12 019	41 513

It is noteworthy that the lands that are highly subject to degradation are acid soils – total 270 882 ha; acidification affects these soil in varying degrees: slightly acidic, 129 298 ha; moderately acidic, 118 716 ha; strongly acidic, 22 868 ha. There are also almost 40 000 ha of salination-affected soils, out of which 1300 ha moderately and strongly saline.

Moreover, other 2263 ha of land are affected by erosion while water excess results in the degradation of another 5677 ha. (6)

#### 4. Hydrological characteristics

The hydrographic basin of the Criș rivers drains an area of over 27 500 km<sup>2</sup>, consisting of four main rivers that converge as the branches of a tree: Crișul Alb (the White Criș), Crișul Negru (the Black Criș), Crișul Repede (the Fast Criș), the Barcău. They all collect the waters from the western slopes of the Apuseni Mountains.

Table 2

Hydrological data on the Criș rivers

Water course	Hydrometric station	Multiannual average flow, mc/s	Highest flow with 1% mc/s provision	Highest flow with 5% mc/s provision	Highest flow with 80% mc/s provision	Highest flow with 95% mc/s provision
Crișul Alb (the White Criș)	Chișineu Criș	23.7	810	560	2.30	1.20
Crișul Negru (the Black Criș)	Zerind	29.4	840	580	3.20	1.95
Crișul Repede (the Fast Criș)	Oradea	24.9	1000	600	3.45	1.60

The Crișuri hydrographic basin presents the following potential:

- theoretical water resources – 3 116 400 thou mc
- technically usable water resources – 744 734 thou mc.
- fishery – 1051 thou mc.

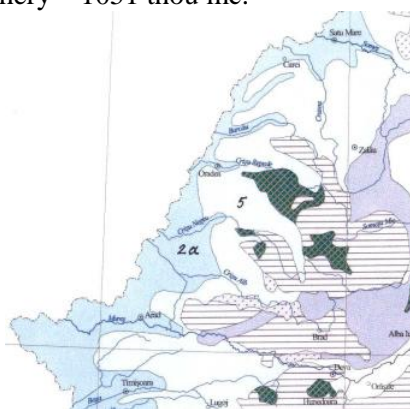


Fig. 4. Hydrogeological zoning of study area (1)

Ground waters are present at depths of 0.5-1 m or even on the surface of the meadows and subsidence plains up to 10 m or even more in the high plains, in the upper terraces (Fig.4).

## CONCLUSIONS

-the climate of the area is temperate-oceanic, differentiated according to the relief, with Mediterranean influences of obvious variability depending on the hydrographic basin.

-geologically, the area presents relief forma belonging to two structural units: the Northern Apuseni Mountains and the Pannonian Depression.

-the land-covering surface deposits have great variability, ranging from winds sands to clayey sands and deposits formed on volcanic rocks.

-geomorphologically, the area is part of the Western Hills and Western Plain which present two main orographic steps: high and low.

-the variety of environmental conditions has determined a genetic variey of soils, from chernozems to alluvial soils and erodisoils, with a predominance of soils belonging to the quality class III and IV.

-the Crișuri hydrographic basin consists in four main rivers converging like the branches of a tree and whose hydrological regime depends on the seasons: 40-45% of the annual water amount flows in spring, often causing flooding.

-phreatic and deep waters are well represented, particularly in the Pannonian Basin which consists in aquiclude, aquitard and aquifer formations to 4500 m in depth.

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