„BABEŞ-BOLYAI” UNIVERSITY CLUJ-NAPOCA

FACULTY OF GEOGRAPHY

DEPARTMENT OF PHYSICAL AND TEHNICAL GEOGRAPHY

BARAOLT DEPRESSION – INTEGRATED STUDY OF PHYSICAL GEOGRAPHY

Ph.D. Thesis

-executive abstract-

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CLUJ-NAPOCA

-2013-

Keywords: integration, relations, correlations, interractions, differentiations, Self-organization, organization, territory, territoriality.

CONTENTS

INTRODUCTION

Along the years spent in "The Land of the Woods" (Erdővidék), in the field excursions and field exploring I had the opportunity to find the differences, sometimes striking, sometimes barely noticeable, which Baraolt Depression has, compared to Brasov Depression.

In the majority of the geographical studies, dealing with the curvature sector of the Eastern Carpathians, in the geomorphologic, climatic, soil studies, in the feasibility study for regional development projects ordered by local authorities, Baraolt Depression stands as an "extension", "sector", or "bay" of the Brasov Depression

In such conditions we find appropriate to elaborate a study through which to highlight the existence of geographical specificity elements of this unit and to demonstrate, as much as possible, that it has its own features, which are unmistakable to those of Brasov Depression and it can be distinguished as a standalone geographical unit.

To fulfil the main objective of this study, along the investigations, we mainly relied on and consequently applied the principle of integration, considered by V. Mihăilescu (1968) as being the most representative among the principles of geography because it is the only one capable to ensure the rebuilding of the unity of the "whole territory", which was investigated at the level of its "parts" along the analyses. The use of this principle in present day scientific context imposes a number of requirements: decreasing the share of simplistic analyses type in the behalf of the integrate analyses, (in which on the first place stands the study of the relations and their determining factors, the capture of the correlations among the factors), then to determine the forms of integration (in space and in time) of the components, of the processes through which the systemic structure is built up, the relations and the functionality which sustain the self organization of the geographic complex.

To give the study a true "integrated" feature, before all, we analyzed the components and the factors of the geographic complex focusing on the identification of the interlinks, of the grade in which one category of processes and phenomena reflects the features and conditionings from other ones. Then the gained knowledge from systematic assessment of the geocomponents were integrated in argumentations and representations in such a way that a territorial "rebuilding" o be possible and this to give back as faithfully as it can be, the geographic reality.

In the same time we considered that an integrated study of physical geography need not shut out the way the physical factors are reflected in the territorial organisation of the depression. So there were referred to some historical, social, economic processes which determined the "metamorphoses" of the "physical" geographic space into a distinguished "territory" having through the way of life, of specific functionality, doubled itself by an authentic cultural identity. According to the same consideration there were analyzed the opportunities and alternatives of economic development of the Baraolt Depression taking into account the opportunities offered by the valuation of the physical-geographical resources.

CHAPTER 1. BARAOLT DEPRESSION: GEOGRAPHICAL LOCATION AND RELATIONS WITH THE NEIGHBOURING UNITS

At a general scale Baraolt Depression is identified as a territory unit of the internal curvature sector of the Eastern Carpathians, bordering at North and North-East with the volcanic apparatus of the Harghita Mountains; at East and South with the Baraolt mountains, also in South there is a wide opening towards the Braşov Depression on the valley of the Olt river; at West and North-West with Perşani Mountains.

At the linear boundering we considered a set of complex criteria which included *geological* (the faults from the edge of the basin, the horst represented by Cetății peak, 641,1m, Tirco peak, 662,5m, Dealului peak, 892,7m, the extension towards South of the upper volcano-sediment layer, the closeness of the lava flow, the geological limits between the structures which are specific to the depression – molasses structure – and the Cretaceous structures, edges of the nappes) *morphometrical* (gradient of the slopes, the energy of the relief), *geomorphologic* (the extension of the glacis), *landscape* (the extension of the beech forest as a relevant element of a mountain landscape).

CHAPTER 2. – THE REVIEW OF THE PREVIOUS RESEARCH REGARDING BARAOLT DEPRESSION

CHAPTER 3. – BARAOLT DEPRESSION: ASPECTS OF AS GEOGRAPHICAL INDIVIDUALITY AND TERRITORIAL TAXONOMY

This study does not deal with the whole ethno-cultural zone of „Erdővidék" (The Land of the Woods), but with the depression area of Baraolt. Its limits were defined in Chapter 1.

By studying the scientific works about Baraolt Depression we can conclude that the geologists accept the existence of a "Baraolt Basin" having its own characteristics that can not be confused with the geological characteristics of the Braşov Depression. Among the geographers there is both a reticence and a lack of preoccupation in defining unequivocally a Baraolt Depression as an individuality of the geographic reality. In most of the works it is accredited the idea after that Baraolt Depression in a “bay”, a “compartment”, an extension of Braşov Depression.

CHAPTER 4. – THE GEOLOGICAL SUBSTRUCTURE AS A PREMISE FOR THE INTEGRATION AND DIFFERENTIATION OF THE LANDSCAPE

4.1. Brief review of the knowledge about the geology of the territory

4.2. Defining highlights regarding the paleogeography of Baraolt Depression

4.3. The structure, tectonics and lithology of Baraolt Depression – determining factors of the geomorphologic individuality

4.3.1. The geologic structure

The base of the depression, formed before the depression itself, is structurally represented by the orogen of the Eastern Carpathians, respectively by the tightly folded, napped of the Ceahlău Nappe.

Over these structures stay unconformably the Pliocene – Pleistocene mollasse stack of the filling of the depression. Initially these formations, sediment in fluvial-lacustrine, lacustrine environment, made up horizontal or deltaic structures. From the geological section can be concluded that these structures were involved in the movements that occurred along the fault systems. These sinking, lifting, unhooking movements made some portions to stay in horizontal structure, some picked up monocline structure, inclined towards the lower parts, and lifted towards the edges of the depression.

4.3.2. The tectonics of the Baraolt Depression

The main directions of the faults that had an important role in forming and in the evolution of this depression are North-East – South-West, North-West – South-East, North – South and East – West. In either of cases we speak about not just one fault but about fault systems of that directions which follow each other rhythmically. We didn’t include the main fault of the Eastern Carpathians given by the drifting of the metamorphic structures over the flysch. This is situated to west the depression, along the Perşani Mountains.

4.3.3. The petrography – the premise for the landscape diversity

4.3.4. The mineral resources of the substructure

The way in which the Baraolt Depression and its surrounding regions were formed and evolved, represents the premise for the individualization of the resources of the substructure, which could be grouped as it follows: resources connected to the character of sedimentary basin and resources connected to the closeness of the volcanic apparatus of the Harghita Mountains. In the first group are included the energetic resources – coal, namely lignite – and some construction rocks – ballast and clay. In the second one we included metalliferous resources – siderite and limonite mineralization – and then the mineral waters.

4.4. The reflection of the geological components in the relief

The components of the geological substructure are the combined result of the geological event chain that succeeded each other in this region from the formatting of the Ceahlău nappe, the drifting of the metamorphic structures over the flysch up to now. The movements along the crust, regional and local faults, which affected as the Cretaceous base as the Pliocene – Pleistocene mollasse stack, the volcanic activity of the South Harghita range, which directed each other, conditioned the completion of the tectonic structure of horst and graben.

The intermittent volcanic activity with paroxysmal phases led to the intercalation, into the sedimentary layers, of three layers of volcano-sediments.

As a conditioning of the specific sedimentation chain of events, beginning in Dacian, six coal layers were formed, from which the first and the third have economical value.

The existence of lignite in conjunction with energy thirst of mankind gave the anthropic relief in the landscape of Baraolt Depression.

The post volcanic events conditioned the forming of iron mineralization outside the limits of the depression, but which influenced the life of the inhabitants in the previous centuries. Another manifestation of the volcanism is the occurrence of 44 mineral water springs, which impose in the relief tiny hills of carbonated rocks.

The tectonics and the structure of the depression as conditioning factors and the way they are reflected in the arrangement of the morphology of the relief, practically offer arguments for the taxonomic division of the territory of the depression in basins, bays of the basins and cuvettes. So we have the western and the eastern basin, Vârghiş bay, Racoşul de Sus bay and Bodoş cuvette.

Also as a reflex of geological conditioning can be noticed the directing of the run-off on the direction of the two main faults of the base: North-South and West-East, respectively the formation of two confluence areas, one in the eastern basin on the Baraolt rivulet, the other in the western basin on the Olt river.

The element of petrography – the upper volcanic sediment layer, of Pleistocene age, being uncovered in the North and North-East part of the depression, conditioned de development of a series of parallel ridges flat or slightly convex, with low slope from North-East to South-West, which resembles to a volcanic plateau segmented by valleys.

Causations and conditionality that are imposed by the defining characteristics of the substructure implicitly show that the cause effect type relations make series, chains like: a cause has got effects and some of the effects can become the cause of other effects from which some can also become the cause of other effects and so on.

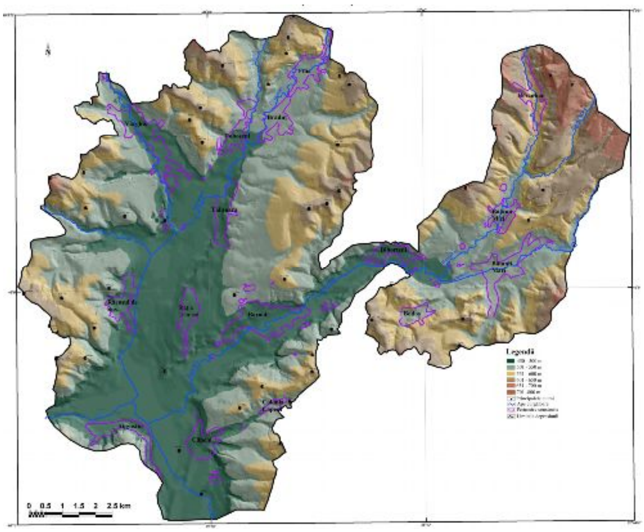
CHAPTER 5. – THE RELIEF OF BARAOLT DEPRESSION

5.1. Defining features of the morphogrphy and morphometry

5.1.1 Hypsometry

To elaborate the hypsometric map of the depression we used a GIS programming language, namely a SML (Spatial Manipulation Language), we have written some variants. Among them we have chosen (map 5) that one which gives back more accurate the morphological stages of the depression, the one with five stages: 450 – 500 m, 500 – 550 m, 550 – 600m, 600 – 700 m and 700 – 750 m.

Map no.5. Hypsometrical map of the Baraolt Depression

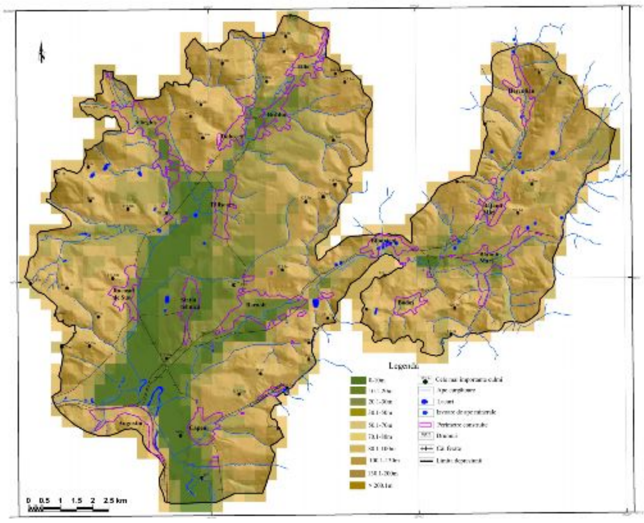


5.1.2 Fragmentation depth

To show the values of this relief indicator, the map of the depression was divided in squares having a side length of 333.333m and the program calculated the value for each square (map 6). We got the minimum value of 0.022m, maximum value of 218.296m and the average value of 59.7979m. After that we grouped the values in nine classes: 0 – 10m, 10.1 –

20m, 20.1 – 30m, 30.1 – 50m, 50.1 – 70m, 70.1 – 80m, 80.1 – 100m, 100.1 – 130m, 130.1 – 200m and over 200m.

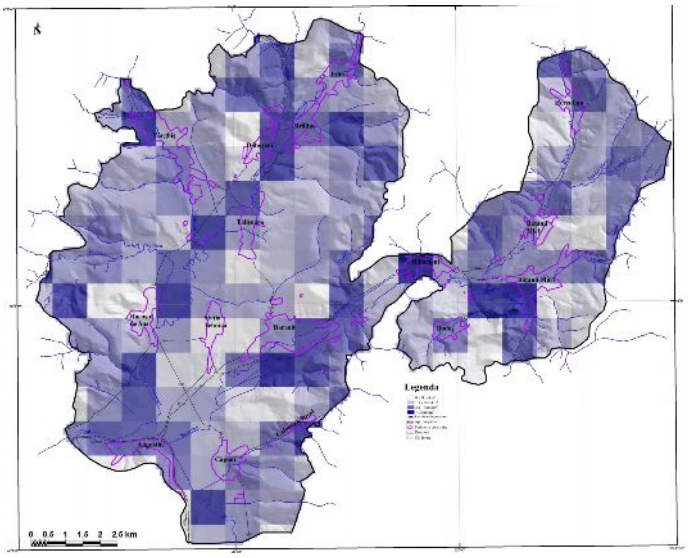
Map no.6: Map of fragmentation depth for Baraolt Depression



5.1.3 Fragmentation density

The calculated average value of this indicator is 1.66km/km^2 and the maximum one is 3.859km/km^2. The values were grouped in four categories (map 7): small densities (0 – 1km/km^2), average (1 – 2km/km^2), big (2 – 3km/km^2) and very big (over 3km/km^2).

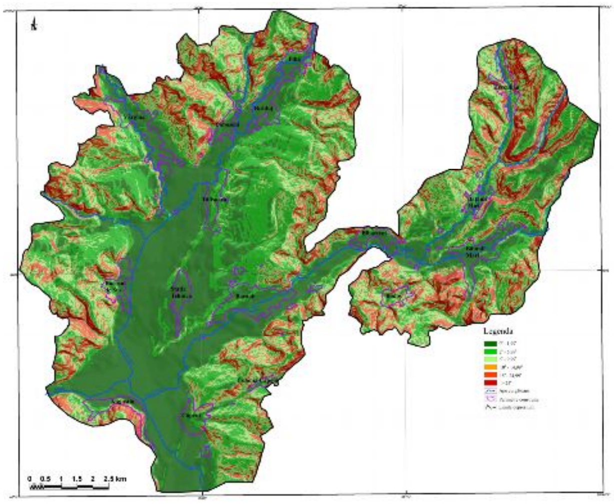
Map no. 7: Map of fragmentation density in Baraolt Depression



5.1.4 The gradients of the slopes

In Baraolt Depression we can talk about six slope classes (map 8): the flat surface; very slightly inclined slopes of 0° – 2°; slightly inclined slopes of 2 – 6; slopes inclined over the average of 6° – 10°; inclined slopes of 10° – 15°; heavily inclined slopes of 15° – 25° and very heavily inclined slopes over 25.

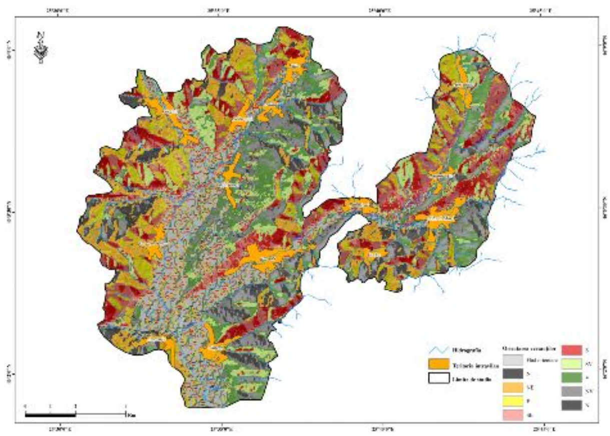
Map no. 8: The map of the inclination of the slopes in Baraolt Depression



5.1.5 The orientation of the slopes

We took in consideration the flat surfaces, the main and secondary cardinal points(map 9).: N, NE, E, SE, S, SW, W, NW.

Map no.9: The map of the orientation of the slopes



5.2. The morphogenetic individuality of the relief

5.2.1. Sculptural relief

5.2.2 Structural relief

5.2.3. Petrographic relief

5.2.4. Fluviatile relief

5.2.5. Anthropogenic relief

5.3. Contemporary geomorphologic processes

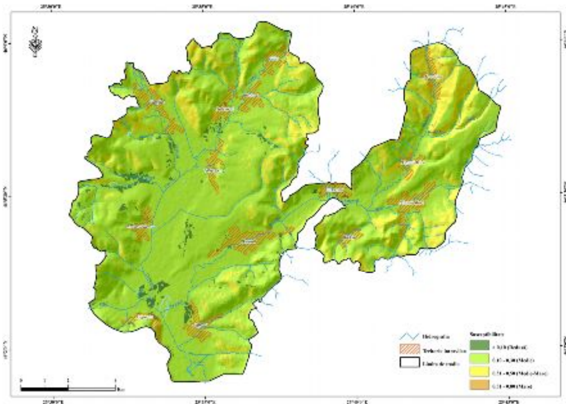
5.4. Susceptibility to landslides

To calculate the average susceptibility coefficient we used the formula given by H.G. nr. 447/2003:

$$suscept = \sqrt{\frac{Hipsometria * Panta}{5} * (Utilizarea + Sol + Adancimeafrag + Densitateafrag + Orientarea)}$$

As a result of the calculation for Baraolt Depression we have got four susceptibility grades for landslides (map 18): low probability for landslides, average, average-high and high probability. From the spatial distribution of these grades we have made a susceptibility map.

Map no.18: The map of landslide susceptibility for Baraolt Depression.



CHAPTER 6. – CLIMATE AND TOPOCLIMATIC DIFFERENCES

6.1. Air temperature in Baraolt Depression

Fig. no.34: The average monthly air temperatures.

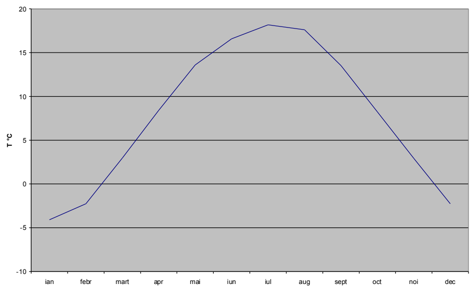
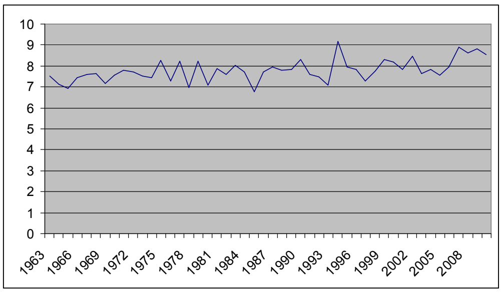


Fig. no.35: The average annual temperature variation in 48 years of observations



6.2. Rainfall in Baraolt Depression

Fig. no.36: Monthly variation of rainfall quantities.

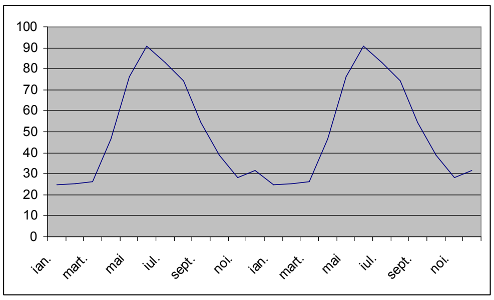
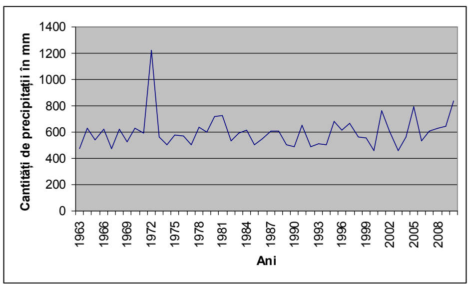


Fig. no.37: The annual rainfall quantity variations along 48 years of observations



6.3. The wind as climatic factor

Processing the available data we got that 120 days a year there is no wind, that means 32.8% of the year, and the average wind speed for 48 years of observations is low: 2.2m/s.

6.4. Extension of some characteristic climatic data by dendrochronological methode (based on the tree ring growth of sessile oak – Quercus petraea)

Fig. no.42. Residual dendrocronological series

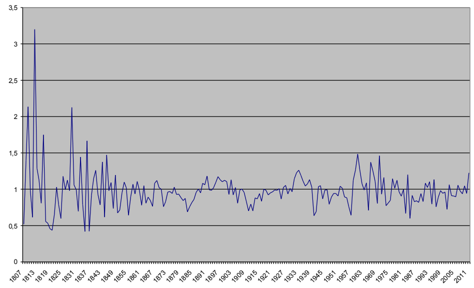
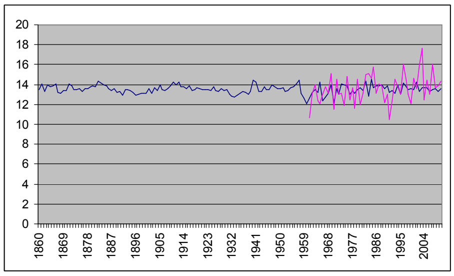


Fig. no47: The variation curve for the common and reconstituted period



6.5. Correlation between the relief and the climate

At an altitude difference of 265,1m between the lowest and the highest point of the depression it is possible to calculate a difference of temperature of 1,32 – 1,59°C.

The slopes of 20° and having South orientation receive the biggest quantity of solar energy during the summer solstice. The proportion of the terrain having a slope angle between 10 and 25° is 17.6%, these are the surfaces that receive the highest amount of solar energy. The slopes with South, South-West and West orientation are in a proportion of 37.81% and are exposed to wind in 53.61% so they can be considered to be wetter than the other slopes and the flat surface

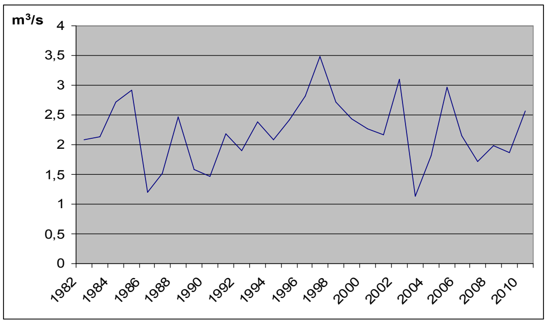
There is a difference between the eastern and western basin, regarding the quantity of rainfall, of 17.4mm in the behalf of the previous one.

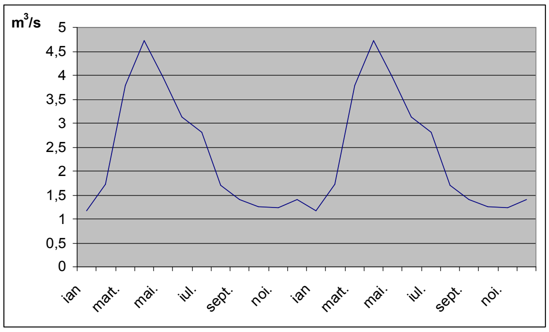
CHAPTER 7. – THE ASSESSMENT OF THE HYDROGRAPHICAL FEATURES

7.1. Drainage network7.1.1.Morpho-hydrographical elements of the main river streams

Vârghiş rivulet

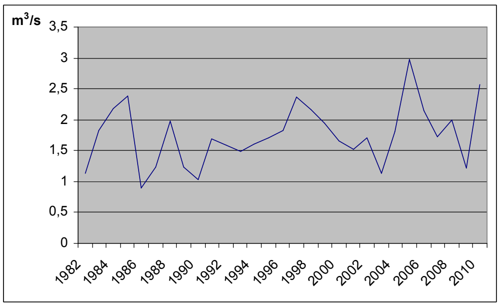
Fig.no.49: The evolution of the average annual flows between 1982 – 2010. Fig.no.50: The monthly variation of the flows

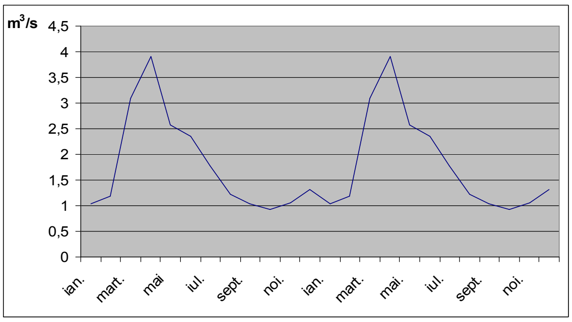




Cormoş rivulet

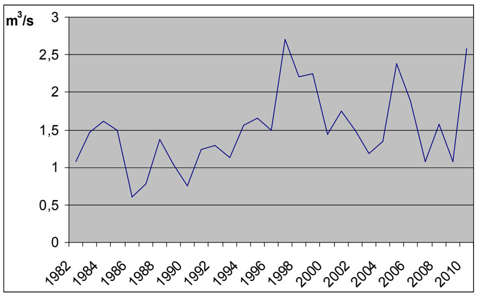
Fig.no.51: The evolution of the average annual flows between 1982 – 2010. Fig. nr.52: Average monthly variation of the flows





Baraolt rivulet

Fig. nr.53: The evolution of the average annual flows between 1982 – 2010



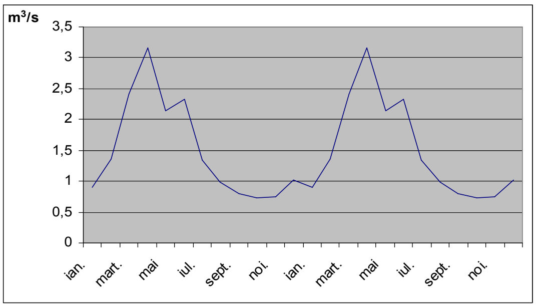
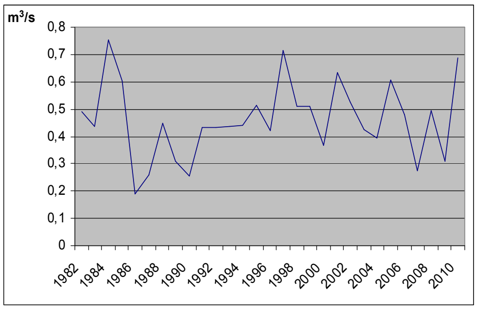


Fig. nr. 54: Average monthly variations of the flows

Ozunca rivulet

Fig. nr.55: The evolution of the average annual flows between 1982 – 2010



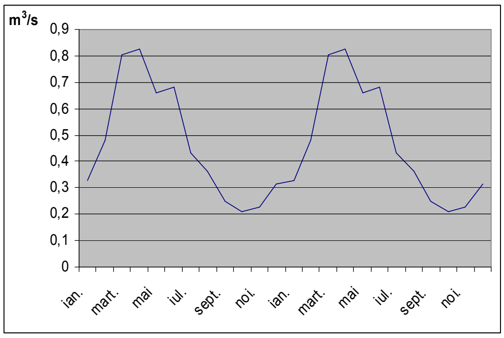


Fig. nr.56: Average monthly variations of the flows

7.2. Lakes and humid areas

Taking into account the type of human activity that generated the number of lakes in Baraolt Depression they can be included into three main categories:

1) lakes formed in the remaining excavations of open pit miming of the coal, having two subcategories: a) the lakes from the abandoned open pits and b) lakes in the rehabilitated open pits;

2) lakes formed in the subsidence cuvettes which evolved over the underground voids remained after the extraction of coal;

3) former riverbeds, which were transformed into lakes by the flood defence works of Olt river and Cormoş rivulet;

7.3. Groundwater

To show some of the physical and chemical properties of the 44 mineral water springs of the studied area and to look for correlations we made measurements of the temperature, pH, and conductivity, and chemical analyses to find out the HCO_3 and free CO_2 quantities contained in these springs.

7.4. Correlations among climate – relief and water flow

The two main grabens which are indeed the two basins of the depression, are in the same time the valleys of the two main rivulets: the western basin being the valley of Cormoş and the eastern one, the valley of Baraolt rivulet. In this way can be shown the causal relation chain among the invariants of this geographic system: ruptured tectonics, graben structure and the flow directing in to North – South direction in which the rivulets flow.

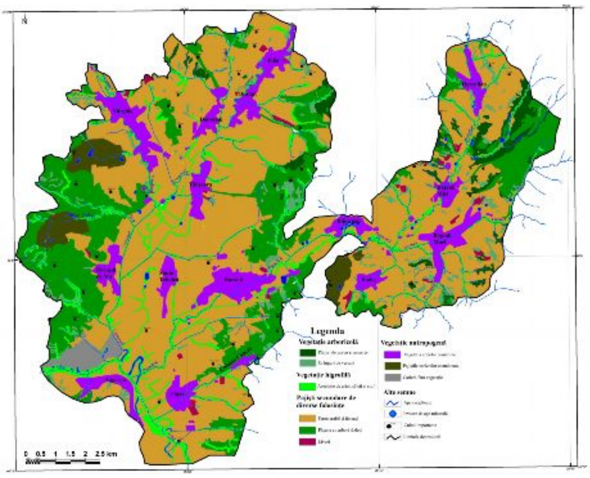
There are differences between the two big rivulets from the western and eastern basin regarding the moments when the extreme flows occur, as a reflection of the relief elements on which their reception basin develops. Here we talk about the altitude, which influences the temperature, which in turn is reflected in the state of aggregation of the precipitations, then in the hold time of the snow cover, in evapotranspiration.

In the case of Baraolt Depression the water flow goes on according to some already existing coordinates, the fluviatile organisms express in agreement with them and lead to the organization of a fluviatile relief characteristic for this area. In this respect some features can be shown: at the entrance to this area the valleys have already got a cross section in U, their wideness and the wideness of their flood plain grow towards the confluence, their water beds make meanders just near the confluence zone, in their longitudinal profile the steep sectors alternate with flat ones, these are the confluences.

CHAPTER 8. – VEGETATION AND THE FAUNA

8.1. Vegetation

Map no.21: The map of vegetation of the Baraolt Depression



8.2. The fauna

CHAPTER 9. – THE EVALUATION OF THE EDAPHIC COMPONENT

Nowadays in Baraolt Depression are going on the following pedogenic processes:

1. clay migration with moderate, weak-hard acid bioaccumulation, with the formation and migration of the clay in Bt layer;

2. brunification with weak-moderate acid bioaccumulation and accumulation of mild humus characteristic for Haplic Cambisol Eutric (WRB);

3. brunification with acid bioaccumulation an accumulation of mild humus acid-moder characteristic for Haplic Cambisol Dystric (WRB);

4. gleyzation on the areas with excess of moisture;

5. accumulation of humic humus on the carbonated rocks made by the abundance of Ca^{2+} ion;

For Baraolt Depression nine soil classes and fifteen soil types can be identified.

9.1. Correlations among climate – relief – water flow – vegetation and soils

The soil genesis, which goes on at the level of a portion of the geographic coverage, is a process in which we can find all interactions, conditionings among its invariants and variables. What we find is the mirror, the materially expressed of all these interactions, conditionings, processes went on during the times. If we reduce the scale of approach at the level of the process itself then the invariants and variable will become its factors, and within we identify as support, as invariable factors the litology and the relief and as variables the temperature, hydric regime – given by the climate and the water flow – the type of vegetation, the activity of the human society.

In the case of Baraolt depression, there were assessed, in detail, all these factors, though there is a necessity to point out synthetically the correlations found among them and which led to the formation and evolution of the edaphic coverage.

As a result of the correlations among climate-relief-water flow-vegetation-soil, we can separate three geographic sectors of the soils in Baraolt Depression: 1) the sector of flood plains, 2) the sector of fluviatile and fluviatile-lacustrine terrace and 3) the sector of the slopes and of the heights. This division represents, in fact, the impose of the relief, as invariant of this system. So it is necessary to treat this chain of correlations, enunciated in the title of this subchapter, around this separation, synthesizing those shown in chapter 9.

9.2. Susceptibility to soil loss

In the calculation of soil loss on different areas the USLE equation uses five factors, which represent the quantification of the specific conditions which influence the severity of soil loss on that area. The equation is:

$$E = R\ K\ L_S\ C\ P$$

where E – is the quantity of soil loss in t/ha/year;

R – is the rainfall intensity factor;

K – is the soil factor;

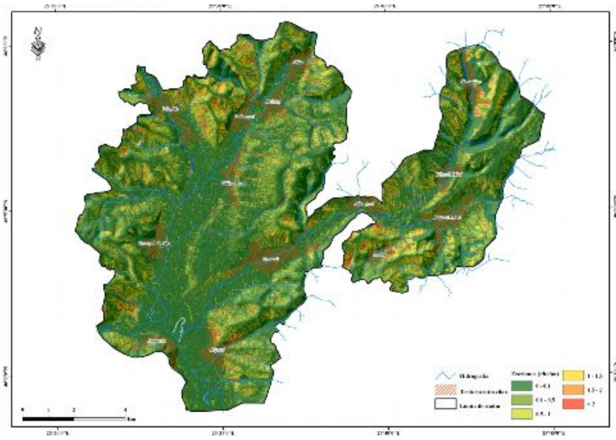
L_S – is the topographic slope length;

C – is the soil cover factor;

P – is the prevention practices factor.

As a result of the calculations we represented on a map (map 26) the spatial distribution of soil loss in Baraolt Depression.

Map no. 26: The map of soil loss in Baraolt Depression.



CHAPTER 10. – THE LANSCAPE STRUCTURE AND THE QUALITY OF THE ENVIRONMENT IN BARAOLT DEPRESSION

10.1. Brief theoretical considerations

10.2. Aspects regarding the typology and dinamics of the landscapes from Baraolt Depression

Along the assessment of the geocomponents, the correlations among them, from which resulted the functions and functionalities of the natural system of the depression, then the appearance of this portion of the geographic cover, emerges eloquently that here coexists three types of landscapes: the landscape of the mixed sessile oak forests, part of the natural landscapes; the agricultural landscape, part of the anthropogenic landscape; and the anthropic landscape of the human settlements and mining.

In comparing two different states of the landscapes we modelled an ideal state of them. To determine the spatial relations among them we established qualitative and quantitative parameters. The first ones refer to the types of soils, land use and the orientation of the slopes and the second ones refer to the values of altitude, gradient of the slopes, the density of fragmentation. We based this on the realities on the field and what should be ideal for a certain type of landscape.

So for the mixed sessile oak forest landscape we took all the soil types, all slopes of every orientation, all the uses of the land excepting the built areas and open pits, the altitudes were fixed from 463m to 728.1m, de gradients of the slopes from 0° to 54.3° and the density of fragmentation from 0 to 3km/km^2.

For the agricultural landscape we established that the orientation of the slopes should be just South-East, South, South-West and West; the types of soils just Haplic Fluvisol, Phaeozems, Haplic Luvisol, Haplic Luvisol Chromic, Spolic Technosol (WRB) and as land use just the plough lands, grasslands, pasture lands and orchards.

For the anthropic landscape there wasn't necessary to pick any parameters just the perimeters of the human settlements and of the open pits.

After obtaining the model, it was compared to the real situation and we found that the former one is far from what should be the ideal landscapes of the depression.

10.2. The impact of the anthropic activity on the quality of the environment

CHAPTER 11. – THE REFLECTION OF THE PHYSICAL – GEOGRAPHICAL FACTORS IN THE TERRITORIAL ORGANIZATION OF THE BARAOLT DEPRESSION

11.1. Organizational processes as a prerequisite for territoriality

11.1.1 Theoretical aspects

There were made clarifications regarding the meaning of the notions of "organization" versus "natural self-organization", "territory" and "territoriality".

11.1.2.Selforganizarional aspects in Baraolt

Detailed assessment of the components of the natural system of Baraolt Depression has given us the possibility to reveal the forms of natural order, which are the result of mutual influences among the components, some having the role of invariants and the other the role of variables

11.1.3. Social aspects and their role in the territorial organization of Baraolt Depression

In this chapter we dealt with the social processes of population, demographic growth in relation with those historical events under which they evolved.

11.1.4. Economical aspects and their role in the territorial organization

The advantage offered by the position of contact with the surrounding mountain frame, with quality pasture land, the dominance in the culture of plants of the fodder ones made that the livestock to be, both in the past and in present the main agricultural branch.

This agricultural function had to be joint to craft activities, which were supported by strictly local resources.

One of the main resources, mostly used was the wood of the sessile oak, beech, mixed forests, less from the coniferous ones.

The carpenters and potters used pigments from minerals for decorating their products. Minerals that can be found in the depression or in the surrounding mountains, which in this way were used as resources at that times.

In showing the other resources through which the depression has got specificity, we have to refer to the underground resources.

At the level of the socio-economical system the coal, namely the lignite, behaved as an attractor of inhabitants, produced an economical emulation unknown till then in the depression, but the events in the latest decades switched its role to the opposite direction. The same lignite has got the role of dissipation and to numb of economic life, forcing the population to emigrate.

Mineral water has been playing an important role in the lives of these people, it is the source of drinking water.

Between 1970 – 1973 four drillings were made in the flood plain of the Baraolt rivulet F7, F8, F9 and F9bis (springs no. 17, 18, 19, 20, Map no. 11), currently supplying the bottling industry.

From all geographic, demographic, housing, social, socio-economical facts crystallize the connections, relations, interactions between the natural order forms, built along the ages and the organizing processes through which the inhabitants of the depression showed their territoriality. Based on the realities offered by natural subsystem, they transformed it, through active implementation of their thinking, according to specific variables of territorial organization processes (interests, motivations, traditions, mentalities) in a territory with undeniable functional particularities.

11. 2. The role of the physical-geographical factors in building up the settlement network

The settlement network of Baraolt depression contains a town (Baraolt), three communes (Bățani, Brăduț, Vârghiş) and nine villages (Bățanii Mici, Biborțeni, Bodoş, Căpeni, Doboşeni, Filia, Herculian, Racoşul de Sus, Tălişoara) each of them administratively belonging or to the town or to one of the communes.

It is clear that all the settlements preferred the flat terrain offered to them by the flood plains of the rivulets of the depression. Bodoş, Căpeni, Tălişoara are the exceptions. The first used both the meadows of its creek and the northern slopes, lower in gradient of the cuvette, the second one preferred a big alluvial cone and the third one the top of the fluviatile-lacustrine terrace.

All the settlements were started along a rivulet or a creek, or very close to it. This shows the importance of this natural element played in the life of the communities.

Taken from another point of view, from that of the fact that it is barred from all directions by mountains, having just a narrow opening towards the Braşov Depression, it gives the sensation of the end of a country, a bottom of a sack. In other words it presents all the conditions to be an isolated land.

The isolation showed itself from the inside too, being realized by a sense of not belonging to any entity, but to just little Country of the Woods. The people have always lived with this thought that they have to manage any situation based just on the conditions and resources given by a land situated between the mountains and the plain of Braşov Depression.

11. 3. Resources and territorial development

11. 3.1 The economic impact of exploitation of the underground resources

Taking into account all the underground resources of the depression, the biggest economic impact, on medium terms, has been done by the exploitation of lignite.

11.3.2. Opportunities and alternatives for economical development based on valorisation of the physical-geographical resources

For having the most objective image of the present status, from the point of view of sustainability, the trends of the depression we used a SWOT analyses.

Based on it, on the socio-economical facts we projected some scenarios:

1) This analyses is not considered and the trend of economical decrease, began in the 1990's with the decreasing of the coal production, is going on.

2) There are considered those strengths and opportunities which lend themselves to the valuation of the underground resources of the depression and of the mountain frame and can be based on the cheap, weakly qualified labour. These resources can be: mineral water, andesite, diatomite, marl, limestone.

3) There are considered the strengths and opportunities regarding the quality of the environment, the closeness to the mountains, the existence of marked tourist routes, of the memorial houses, of the elements for which big areas are part of Natura2000 network, the low price of the estates.

4) There are considered the same aspects as at scenario number 3 but including the balneary characteristics of the mineral waters.

CONCLUSIONS

In conducting this study we followed two objectives. The first one was to try to demonstrate, by capturing broad spectrum of arguments, that Baraolt Depression owns a series of elements that give to it a definite geographical specificity, according to which it can be individualized as an independent geographical unit, or at least a distinguished subunit of

Braşov Depression. The second objective was to elaborate a study of synthesis as detailed and truthful as possible, regarding this depression area, because of the scarcity of geographical references about it. So by the detailed analyses of the physical-geographical factors we tried to give a truthful image regarding their way of integration in the geographical landscape understood as a synthesis between the natural determinations and socio-economic superstructures, which were formed and developed according to these.

On the basis of those investigated and interpreted, we appreciate that, through this study we brought believable arguments, according to which we can conclude that Baraolt Depression really possesses enough specific elements which require it as an unmistakable geographic entity.

Among the most significant arguments that sustain the (physical)geographical individuality of the depression the following can be pointed:

1) *The presence of horst and graben associations* as an expression of the strongly tectonized base;

2) *Morphological diversification of the depression* in the form of basins, bays, and cuvettes imposed by the presence of the faults, grabens horsts;

3) *The disposal of the drainage network* in Baraolt Depression bears much stronger the footprint of the tectonic conditioning, the majority of the rivulettes flow along the main tectonic ruptures;

4) *The presence of volcanic structures* which impose themselves in the morphology, diversifying it by selective modelation of the volcano-sediment layers according to their structural and petrographic particularities;

5) *The absence of piedmonts*;

6) The existence of *specific underground resources;*

7) The existence of significant *landscape differentiation*;

8) Baraolt Depression also possesses truthful specificity regarding the historical, social, economical and cultural aspects which in time determined the „metamorphosis" of a physical-geographical space in a well individualized territory in terms of an authentic way of life and authentic cultural identity.