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Faculty of Geography and Geology
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Sir / Madam.....

We do know that on 28 November 2015 at 09.00 in the amphitheater B8 in the Faculty of Geography and Geology of the University "Al. I. Cuza "University, will take place in a public examination of the doctoral thesis entitled "Relations pedo-geomorphological in the middle basin of the Prut between Tutora and Gorban (Front of the Prut)" elaborated by PhD. Daniel Curea in order to obtain the scientific title of Doctor in Geography.

Doctoral Committee composed of the following:

President:

Univ. dr. Adrian GROZAVU, "Alexandru Ioan Cuza" University, Dean of the Faculty of Geography and Geology

Scientific leader:

Univ. dr. eng. Ion Ionita, "Alexandru Ioan Cuza" University

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Univ. dr. Constantin Rusu, "Alexandru Ioan Cuza" University

Please find doctoral thesis summary and invite you to attend the meeting for the public.

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1. Introduction

1.1 geographic limits

The area studied represent a cutting from the right slope of the river Prut Valley located in the eastern part of Moldavian Plateau, more precisely on the northeastern border of the Central Moldavian Plateau (Figure no.1).

Fig. 1. Etymology of Prut Face (after Ungureanu, 1993).

With a length of 43 km between Păun Hill (407 m) and Câlcea Hill (89 m) direction NW-SE and a maximum width of 10 km between Curmăturii Hill (381 m) and Marmurii Hill (193 m) in the direction of SV-WE, the area has a total of 27473 ha.

This hilly area is bounded on the westwards by the Vasluieț and Crasna catchments, eastwards of the Prut-Jijia floodplain, northwards of lower Bahlui catchement, and southwards of the Huși Depression.

The *"Fața Prutului"* was given by Nastase Gh (1946) a segment of the right slope of the Prut Valley between the "gate Țuțora" and Grozești, that watched on the left slope, or more specifically the Prut floodplane, appears very imposing. Later, in 1958, Năstase Gh called this area *"Cuestele Prutului" (cf. Martiniuc C., 1960)*.

Fig. 2. Fig. 2. The character subsequently diagonal of the Prut river valley between Țuțora and Grozești.

1.2. Pedo-geomorphological research history

Direct studies to address particular pedo-geomorphological elements of the middle catchment of the Prut are quite few. Most of the information coming from the works that encompass all or part of the Central Moldavian Plateau or Moldavian Plateau. Analyzing the work developed over time, however, we can try dividing them into two groups, each with its fundamental and applicative specifics.

1.2.1. Geomorphological research history

The first Moldavian Plateau geomorphologic research belong to David M., who published the first results of his research into the *Workings of a morphological sarmatic plateau* (1920) and *Geological research in the Moldavian Plateau (1922)*.

A work of reference for applied geomorphology is *Soil erosion on agricultural land and control her Moțoc M*. (1963) draw attention to the decline in soil fertility due to accelerated erosion and that rational use of soil is much diminished by the presence of ephemeral gully and gully erosion, leading sometimes even to the destruction of transport ways and human settlements.

Outstanding concerns regarding the geology of Central Moldova between Siret and Prut are due Jeanrenaud P. (1961, 1965, 1967, 1970, 1995).

I.Ioniță (2000b), in his work "applied Geomorphology, processes of degradation of the hilly regions," provides important data concerning land degradation through erosion based on research carried out in the period 1970-1999 at the *Central Station of Combating Soil Erosion Perieni*.

I. Ioniță (2000c), in the "Relief of cuesta from the Moldavian Plateau", based on observations of long-lived, establishes two types of structural asymmetries, one responsible for development of cuesta with northern general exhibition, specifies the subsequent valleys, and the other responsible for cuesta having front with western exhibition specifies consequent valleys.

1.2.2. Soil research history

In 1970 founded the Institute for Soil and Agrochemical Research (I.C.P.A.) that shifting soil study to meet both the objective of fundamental scientific and practical, utilitarian.

In 1980, a team of experts coordinated by the *Conea A., Florea N. and Puiu St*., they developed the Romanian System for Classifying of Soils, inspired by the FAO-UNESCO and adapted to the specific conditions of our country. This model was used until 2003 when it is replaced by a new version, the Romanian System of Soils Taxonomy under coordinated by the *Florea N. and Munteanu I*. Later, in 2012, under the same coordination, improved and modified version appears on the Romanian System of Soil Taxonomy.

In 1987 was published in three volumes Soil Studies Elaboration Methodology (*Florea N.et al)*, which, together with the SRCS (1980), SRTS (2003) and the SRTS (2012) constitutes a valuable tool for researching soils in Romania.

2. Methodology and stages of work

The scientific approach taken I turned to a number of methods and means of geomorphology and pedoogy.

The work carried out for the drafting of this paper can distinguish three important stages of work, namely: the preliminary stage, the field stage and the office stage. In the first stage consult library material available and gathered the necessary materials concerning the compilation of the database features of morphological and physico-chemical properties of soils, as well as the physical and geographical characteristics of the area under study.

In the second stage, of field, have conducted numerous displacements on the frame of the Moldavian Central Moldavian plateau in order to observe and understand the correct genetic types and both main forms of relief and intensity of the degradation processes of agricultural land

In this context, there have been a series of topographic measurements but mostly completed geomorphological mapping of the area studied. In addition, it highlights and validation (checking on the field) to issues in office.

The third stage, the office consisted of homogenisation of data and soil conversion studies from SRCS 1980 and SRTS 2003 in SRTS 2012 so that the entire pool was drafted soil map covering 110 singular units of soil and 7 associate units of the soil.

3. Considerations regarding the factors that contributed to the formation of the present relief and soil covering

The particularity of geomorphologic front of the Prut river is the fragmentation of the relief in the form of the sculptural hilltops, separated by a network of valleys typical consequential, framed in a general ensemble of cuesta relief. How structure, led to the formation of the cuesta relief and lythology at the rapidly deepening valleys, the geomorphologic agents heve a primary role in local morphogenesis.

3.1. Geology

From the geological point of view, the area studied is part of the Moldavian Platform area, from whose sedimentary cover denudation processes revealed formations Bessarabian (Middle Sarmatian), Chersonian (Upper Sarmatian) and Meotian.

They show a slight tilt of about 7-8 m/km in the direction of NNW-SSE, a specific geological structure monocline (*Jeanrenaud P.*, 1961, 1965, 1971; *Jeanrenaud P., Saraiman A.*, 1995; *Ionesi L. et al.*, 1995).

3.2. External factors (climatic, biotic hydrid)

The area's climate is temperate continental with excessive shades, characterized by cold winters with low temperatures, high humidity and relatively high frequency of temperature inversions, and summer temperatures are high and low humidity.

To characterize the thermal conditions and average monthly and annual rainfall were used data recorded at the stations, Vaslui, Huși and Negrești, filled in with values recorded at rainfall stations at Huși, Avereşti, Răducăneni and Poieni.

The multiannual average temperature fluctuates between 9.2°C at Negrești and 9.8°C at Huși. Precipitation multiannual averages oscillate between 485.3 mm at Huși and 779.6 mm.

Hydrographic network of the Prut middle catchment is formed by a number of right-bank ttributaries, rivers Tătarca Comarna, Covasna, Cozia, Bohotin, Moşna and Ochiul. They have developed small pools, not exceeding 10.000 hectares each, namely: Moșna of 8.201 ha (30% of the total), Bohotin 6.107 ha (22%), Tătarca 2.939 ha (11%), Covasna 2.714 ha (10%), Comarna 2.256 ha (8%), Cozia 1.609 ha (6%), and Ochiul of 546 ha.

The wrapper nearest the biotic floristic, compiled by Borza (1960), falls within the province of balcano-moesică, being composed of species belonging to the silvo-steppe and deciduous forests.

The most extensive are the forests of sessile oak (Quercus petraea) and mixed with lime silver (Tillia tomentosa) and hornbeam (Carpinus betulus). These favourable conditions are met in the upper half of the slopes, and in the most high mentions is the mixture of sessile oak (Quercus petraea) and beech (Fagus sylvatica).

4. Relief

Florea N. et al. (1968) believes that in the circumstances of a rugged territory, the relief is one of the major factors in the formation of soil, which permeates not only directly but also indirectly causing an stackable and a hue of other factors (climate, vegetation, etc).

The main genetic relief types in the studied area are the structural relief, the sculptural (fluvio-denudational) relief in generally monocline and the fluvial accumulation relief.

The main feature relief located in the northeastern border of the Central Moldavian Plateau (front of the Prut) is the sequence of cuesta associated valleys typical of predominantly subsequential right tributaries Prut river.

4.1. Morphography and morphometry characterisation of the river basin studied

Morphography characterisation

Ensemble morphography of hilly area from the middle basin of the Prut is typical of the Central Moldavian Plateau, being formed by plateaus, the sculptural hilltops and relatively deep valleys asymmetric.

The structural–lithological plateaus have the most extensive development in the central-southern part, in the Bohotin catchment and Moșna catchment maintain in the relief under the form of more restrained erosion remnants grafted by the Bessarabian calcareous-sandstonic plate.

The main sculptural hilltops, of 41 km with general orientation direction NW-SE, located in the western part of the area studied splits of Vasluieț and Crasna catchments and small pools right-bank tributary of the middle Prut.

Morphometry characterization

Hypsometry analysis

According to hypsometric share class areas, the area with an altitude below 100 m has a weight of 22.22% (6.105 ha) occupy the basin surface and bottom sections of the lower middle-main local valleys and lower slopes that fall within these valleys. Morphological classes between 100-300 m, have the largest expansion of 19,498 ha which represents 70.97% front of the Prut. Setting altitude of 300-400 m has a share of 6.35% (1,746 ha) in the middle basin of the Prut and closely follows the main hilltops of Vasluiet-Crasna and Prut. The surface altitude of 400 m occupies only 0.46% (124 ha) of total area (Figure no. 3).

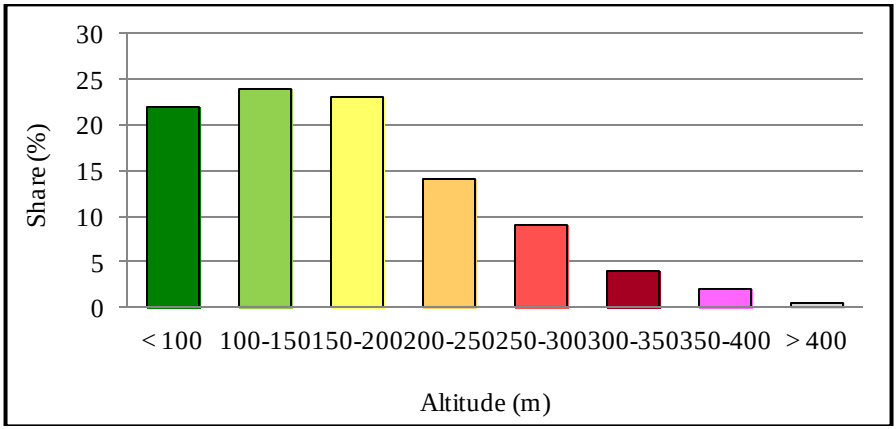

Fig. 3. The share of land on hypsometric classes.

Gradients land

The mean gradient in the studied area is 14.84%.According histogram class slope areas, the maximum share of 39% (10 632 ha) belongs to a class of 5-18% slope, encompassing the cuesta backslope and the lower third of cuesta front. Then follows the sloping land with a slope of less than 5% (6,500 ha), occupying a quarter of the surface and extending over flood plains, structural-lithological plateaus, hilltrop, terraces etc. . Together, these two classes comprise 63% slope (17 132 ha) of hilly areal surface. Not to be neglected are between 18-27% slope land occupying 7756 ha, Map staking highlights the presence of two large tilting strip of land, more than 27% over an area of 2,585 ha, or 9% of the total (Figure no. 4).

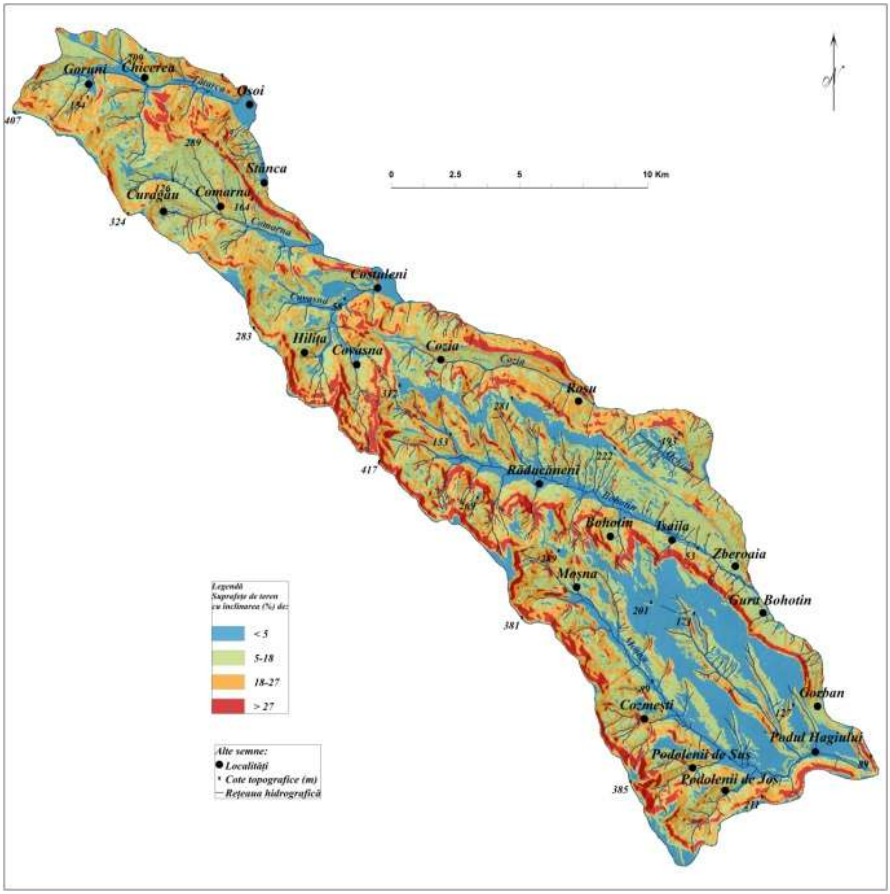

Fig. 4. The map tilt lands front of the Prut.

4.2. Genetic types and landforms of relief

Geomorphological diversity appreciable hilly area studied is the result of lengthy modeling of sedimentary formations, the general monocline structure. The predominant share of 79% of hilly area investigated lies with sculptural relief (fluvio-denudațional) in generalie monocline followed structural-lithological relief and, last, relief the fluvial accumulation (Figure no. 5).

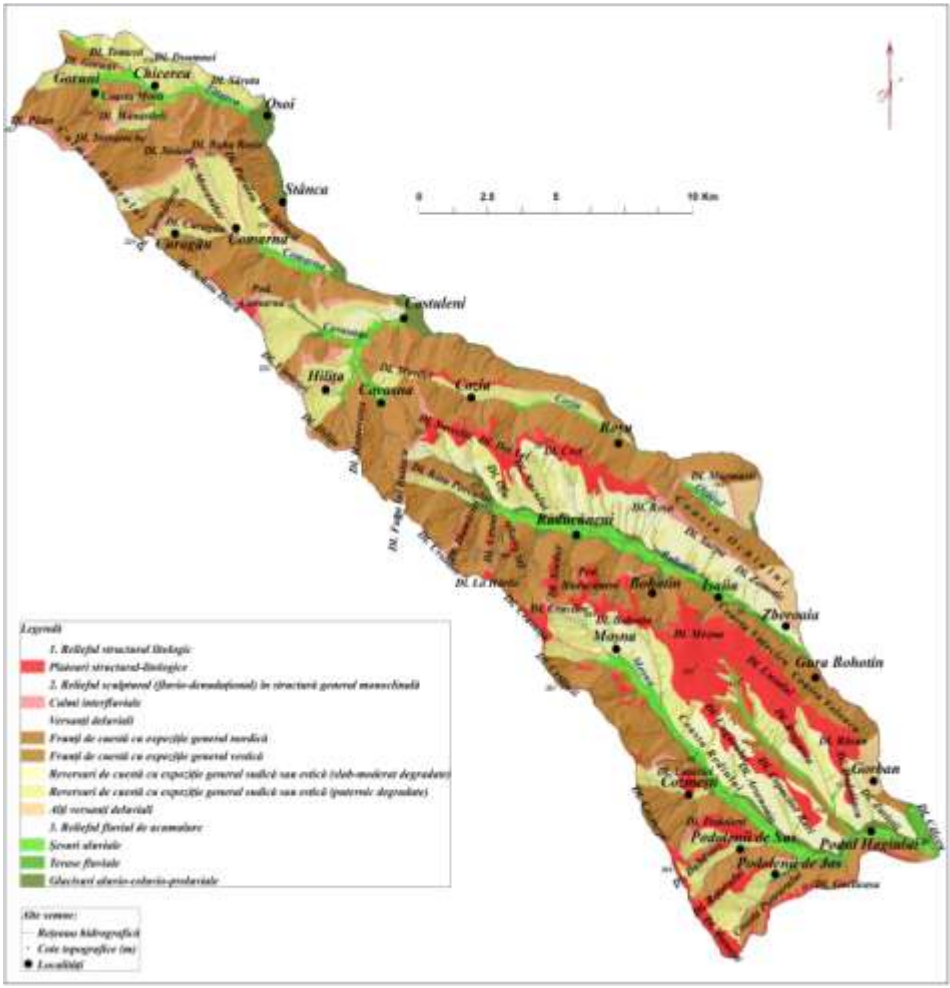

Fig. 5.. The map geomorphological front of the Prut.

4.2.1. The structural relief

The structural relief, expanded appreciably over 3,180 ha (12% of total), ranks second, subordinated to the relief sculptural (river-denudațional) and appropriate relief in the form of plates or shoulders structural-lithological (Table. No.1).). Also here include the main types of valleys and differentiation developed monocline structure (homocline).

Table. 1. Share the main types and forms of relief middle cathment of the Prut.

Nr. crt.	Genetic types of relief	Landforms	Surface	
			(ha)	(%)
1.	The structural relief	*Total*	*3.180*	*12*
		Lithological structural plateaus	3.180	11.7
2.	The sculptural (fluvio-denudational) relief in generally monocline	*Total*	*21.743*	*79*
		The sculptural hilltops	953	3
		The hillslopes from which	20.790	75.7
		Cuesta fronts	12.143	44.2
		Back slope	8.225	29.9
		Other hillslope	422	1.5
3.	The fluvial accumulation relief	*Total*	*2.550*	*9*
		Flood-plains	1.552	5.6
		River terraces	76	0.3
		Alluvial-colluvial-proluvial glacis	922	3.4
Total			27.473	100

4.2.1.1. Lithological structural plateaus

The lithological-structural plateaus are required by this close to the ground surface horizons tougher rocks or calcareous sandstone bassarabian or sandstone meotian cineritic Structural plateaus, platforms in the sense given by David M. (1922), holds a considerable weight of 12% (3,180 ha) of hilly areal surface of the middle basin of the Prut. These plateaus remain today in the form of relief by erosion wider (typical dishes) or smaller (shoulder), grafted harder rocks bassarabian, chersonian or meotian.

The most common include structural plates developed plate calcareous sandstone lithology Basarabian. Among them stands out shelf Gorban-Mosna, down on

1716 ha mainly in the basin and clearly outlined in the hills Mosna, Volocica, Unsului, Răsun, Dodolinca, Roșeasca, Copacilor Rari, Ungurului și Mosnisoara (figure no. 6)

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Fig. 6. Alignment of lithological structural bench on the right side of Bohotin Valley, seen from the plateau Mosna (foto Ioniță I., 27 mai 2013).

4.2.1.2. Types of valleys conditional structure

The main types of geological structure developed are valleys consequent / reconsequent, subsequent and obsequent.

Valleys consequents / reconsequents (cataclinal) are formed and developed in the general direction geological layer (NS) and typically presents a symmetrical cross section. However, most valleys consequents / reconsequents Plateau Moldova, including in the middle catchment Prut, in extended sense, is characterized by an asymmetrical cross section (Ionită I., 1998, 2000).

The Prut Valley (formed on the surface of the plain original Sarmato-Pliocene) is consequent with subsequent small diagonal sections and between Tutora and Grozesti.The consequents valleys, oriented NS, with broad development especially

on the left side of the Prut River in Moldova are aged Pleistocene, when sea plain already had a sculptural character (Băcăuanu V., 1968).

Subsequent valleys (ortoclinale) have VE and EV flow direction transverse to the general inclination geological layers or they cut down at an angle greater than or less than 90 º (Băcăuanu V., 1968). Typically these types of valleys is classic asymmetric cross section, the reverse slope inclination oriented layers, the overall exhibition northern plays the leading role cuesta front, is generally short, steep affected by geomorphological processes. Instead, according to the inclination of the slope layers, with the broad southern back slope it is a comprehensive, uniform, gentle slopes and less affected by geomorphological processes. These are site specific valleys studied in the context of their orientation from west to east, left side is a back slope and right side is a front cuesta.

Obsquentee valleys have reverse flow direction orientation geological layers, with symmetrical cross section, with highly degraded hillsides and at short longitudinally. In this category are published on the cuesta front valleys, like those on the right side of the valley Bohotin (Pietrele, Bazga, Pagubasul, Hemeiosul, Chiriloaia Isaia) or top Covasna.

4.2.2. The sculptural (fluvio-denudational) relief in generally monocline

The sculptural (fluvio-denudational) relief in generally monocline is predominantly genetic type as the distribution in the studied area as an area of 21.743 ha dealing, which is 79% of the total area of the basin. It requires Front of the Prut area by two specific forms, namely: the sculptural hilltops and the hillslopes

4.2.2.1. The sculptural hilltops

Donisă I., N. Boboc and Ionita I. (2009) define the sculptural hilltops as the top of a prolonged and relatively narrow interfluves the mountainous, hillys or rolling hills. Front of the Prut hilltops peaks in a small share of only 3% of total sculptural relief (Figure no. 7)

Fig. 7. Sculptural hilltops Vasluiet - Covasna (Prut) west of Hilita (Photo Ionita I., August 21, 2015).

4.2.2.2. The hillslopes

The hillslopes are the predominant form of local relief extending the 20 790 ha representing 76% of the Front of the Prut. The relief studied is typical Moldavian Central Plateau, where most characteristic landforms are structural-lithological plateau and cuestas. On the other hand, the main components of a cuesta, front and backslope, are two major categories of slopes. The cueasta fronts cut the ends the geological layers, they are short and adversely affected by degradation processes. The backslopes are in accordance with the inclination geological formations have gentle slopes and are much more extensive area.

For an understanding of the peculiarities of the Moldavian Plateau valleys and hence the relief cuesta result Ionita I. (1985, 1998, 2000) recommends consideration of a double system of stratigraphic slopes, which generated two types of structural asymmetries. The author takes into account the plan mainly on the north-south with an inclination of 6-7 m / km, responsible in the structural asymmetry of I and another west-east side, about 3 m / km, has favored the structural asymmetry of the order II. The result of the two plans is to tilt stratigraphic geological formations overall, 7-8 m / km NNW-SSE direction, monoclinale specific structure of Moldova Plateau. In such

an approach, differentiation slopes is subject to how the network of valleys highlights two structural asymmetries.

Structural asymmetry on the order I, major general inclination southward geological formations, is typical subsequent valleys. Their cross section is classic asymmetric, where the opposite slope inclination of the layers acts as cuesta front exhibition north and the other side, according to the inclination of the layers is a backslope of the general exhibition south. Tilt sideline, 3 m / km from west to east, determined by the tilting more pronounced Moldova Plateau contact with Carpathian Orogen is responsible for the *structural asymmetry of the order II*.

This is evidenced by the valleys most consequents / reconsequents with a symmetrical cross section, the left side is a cuesta front with exhibition west (Carpathian Orogen oriented), and the right side is a back slope of the exhibition eastern.

For Moldova Plateau, consistent valleys are typical of the Siret and Prut Rivers and valleys with a general north-south direction from Tutova Hills and Covurluiului Plain . It pointed out that in the study area, the reconsequents valleys are very weakly, not required in relief and practically does not reveal structural asymmetry of the order II.

4.2.2.2.1. The hillslope role cuesta front

The cuesta fronts occupies 12 143 ha (44% of the total area), so most of the studied area. In this area, 12 107 ha incumbent cuesta front with general exhibition north and only 36 ha of cuesta front with general exhibition west of Moşnişoara higher, reflecting almost exclusively dominated subsequent valleys and hence the structural asymmetry order I of Front of the Prut.

4.2.2.2.2. The hillslope, commonly back slope

In Moldova Plateau back slope is tilting slopes with orientation according to SSE genaral of geological layers. These hillslope are usually extend inclined moderately weak, affected mainly by surface erosion and mainly used as arable land or vineyards. The characteristic feature of the back slope obverse of the area studied is that they are subordinate, not predominant, whereas the share they occupy 8,225 ha (30% of the total area). Of this area, 2.911 ha (35%) returning back slopes of weak-moderate degraded and 5.314 ha (65%) strongly degraded.

4.2.3. The fluvial accumulation relief

Although the whole area studied has a predominantly sculptural, along the main valleys (Tătarca, Comarna, Cozia, Covasna, Bohotin, Mosna) or contact between different levels of relief, meet various landforms accumulative or acumulativo-sculptural such as plains, terraces and colluvio-prolluvio-delluvial glacis.

4.2.3.1. Flood-plains

Alluvial plains are the latest forms of relief accumulation of Holocene age, occurring due to the action hydrographic network, with the lowest values of gradient and altitude. They occupy a total area of 1,552 ha which represents 5.6% of the studied area.

4.2.3.2. River terraces

Although the Prut Valley is one of the most important valleys and advanced in the Moldavian Plateau, in the studied area we noticed that its river terraces have a very limited extension.

This finding is enforceable compartment nordic diagonal subsequently, where, in the context of the asymmetry of order I, terraces Prut are widely developed on the left side of Moldova (back slope with general exhibition southwest) and missing on the right side of Romania.

In contrast, in the south in contact with Depression Huşi in Calcea Hill, Gugiuman I. (1959) identified two levels of terraces with gravel run: T25 m (Terrace Rabiia) and T55-60 m altitude relative called Terrace Calcea-Făgădău.

4.2.3.3. Connection formations

In most cases, the transition from surface slopes affected by surface erosion deep erosion or landslides in the alluvial plains smoother surface to make contact through accumulations (colluvium, prolluvium, glacis). These formations occupy 922 hectares representing 3.4% of the area studied.

The outlet waterway Tătarca Comarna, and Covasna Comarna develops in the Prut most prominent dejection cones from the researched area are located towns Costuleni and Osoi.

4.3. Present day geomorphic processes

4.3.1. Soil erosion

To estimate the annual average soil erosion model was applied USLE (Universal Soil Loss Equation) developed by Wischmeier and WH Smith (1958, 1965, 1978), adapted Moţoc M. et al. (1975, 1979) for the specific conditions of Romania and over the ICPA (1987) in the methodology of drafting soil studies.

The improved ROMSEM developed by M. Motoc and Mircea S. (2002) was applied in different areas of Romania (Biali & Popovici, 2003; Bilasco et al., 2009; Dumitru et al., 2010; Arghius et al. 2011; Patriche et al., 2012) and is described by the following equation:

$$E = R \times K \times L \times S \times C \times P$$

where:

- E: Average annual erosion rate (t / ha year);
- R: Erosivity rain factor;
- K: Soil erodability factor;
- L:The influence of slope length factor;
- S: Slope influence factor;
- C:Correction factor for anti-erosion vegetation;
- P: Working coefficient correcting erosion.

The erodibility rainfall (R) was extracted from this factor zoning for Romania (ICPA, 1987) and amounted to 0.1 for the study area. To determine soil erosivity (K) has left the soil map at 1: 5,000 in vector format.

Histogram average annual loss of soil in Figure no. 8 suggests that the total agricultural area, annual mean soil loss due to surface erosion on farmland in the Front of the Prut, approximately 62% (10 881 ha) erosion is under 8 t / ha / year, 27% (4712 ha) falls loss of 9-16 t / ha / year, 10% (1,715 ha) with 17-30 t / ha / year and 1% (292 ha) with over 30 t / ha / year, which means that 38% (6719) of agricultural land must be properly equipped organization works and erosion control works.

In the Front of the Prut, the lowest annual soil loss of 6.2 t / ha / year is recorded as arable land is located mostly on structural-lithological plateau, back slope degraded and floodplains.

Overall, it appears that annual mean soil loss caused by erosion on agricultural land area of 7.8 t / ha / year, so harvest losses are reduced in the short term but important, accumulating the long term.

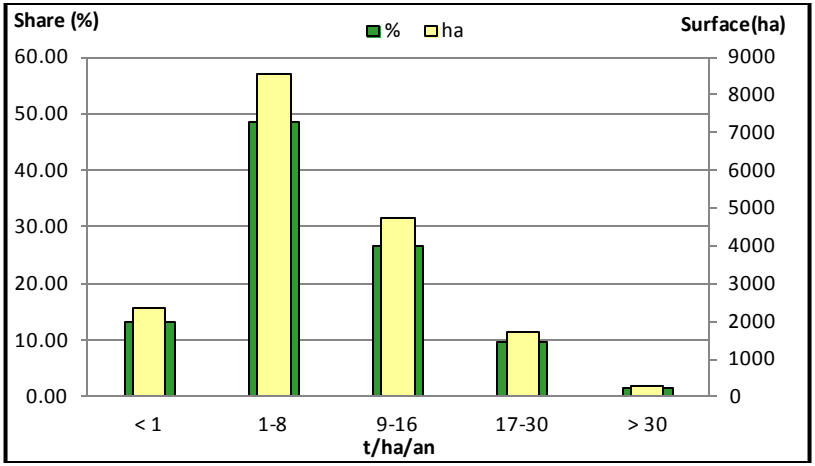


Fig. 8. Histogram average annual soil loss on farmland

4.3.2. Gullying

The area of hilly in the middle basin of the Prut using ortophotoplans edition 2005 model digital terrain processed from contours scale of 1: 5000 and field observations were identified 107 gully, valley side gullies and valley bottom gullies, occupying a total area of 878 ha representing only 3% of the total.

Although they hold a low share in the investigated area, ravines contributes to considerable fragmentation of the landscape by creating a favorable triggering mass displacement processes (subsidence and landslides).

4.3.3. Mass movements (falling, landslides)

Landslides are the most spectacular geomorphological processes, and there is the sense of Băcăuanu V. (1968), preceded by a long period in which the conditions causing imbalance rock masses and the onset, development and particulars of presents the micro phenomenon created or highlight these circumstances, the mandatory presence of water.

Based on orthophotoplans, 2005, the numerical model of Land obtained from processing contours scale 1: 5,000 and observations in the field, it was found that the total area occupied by landslides in the area studied is 14,998 ha which is 54.6% of the total area (Figure no. 9).

Stabilized landslides largest share of 97.2% (14 585 ha), while the active landslides is restricted on 413 ha (2.8%).

Fig. 9. Map landslides in the Front of the Prut.

4.4. Geomorphological zoning

Based on previous geomorphological characterization they can easily separate two distinct compartments, namely compartment northern and southern section. In addition, this geomorphological zoning is enhanced, as we shall see later, and in terms of soil and land use. Main geomorphological scientific underlying principle of this subdivision are subsequence right tributary valleys of the Prut and differentiation induced structural-lithological plateau. Nordic compartment includes typical busy area of "Front of the Prut" narrowly, which is subsequent diagonal Prut Valley (sideways)

and the tributaries of the right of the Prut are typically Subsequently, west-east. This compartment hilly include Tătarca valleys, Comarna, Covasna and tails and occupies an area 11,184 ha (41% of the total area).

Although similar in length to the south (20-21 km), the northern section is much narrower, highlighted feature of small value or its minimum width, 3,300 m (southern half of the department) or the average width of 5,300 m (55% less than in the southern compartment). This feature is closely related to developments valley Prut, respectively homoclinală deepening and moving it to the right. From here, beheading a large share of river tributaries right (especially lower and middle basin), a phenomenon confirmed by the current small area of these pools, under 3,000 ha each.

Then we consider that argument further, the ratio of subordination of the left in these pools (predominant role of back slope exposed to the south) which holds only a third of the area of the compartment north, while the right (almost exclusively forehead cuesta front north) extends over two thirds. Logic, compared with the situation in other subsequent valleys of the Moldova Plateau, this report is clearly reversed abnormal in that cuesta obverse of that expansion had to be dominant against cuesta front. Logic, compared with the situation in other subsequent valleys of the Moldova Plateau, this report is clearly reversed abnormal in that back slope of that expansion had to be dominant against cuesta front.

Southern compartment is extension of "Front of the Prut" in a consistent stretch of the valley Prut, but taking into account the principle subsequently, there have been included subsequent valleys of Bohotin slanting and Mosna (the latter typically has a significant subsequent section).

It occupies 16 289 ha (59% of total), and local hilly landscape is underlined by the remarkable expansion of structural-lithological plateaus (especially shelf-Moşna Gorban, of 1716 ha), typical Moldavian Central Plateau.

5. The soils

5.1. Representative pedogenetical processes in the study area

Soil is the result of joint action of all factors pedogenetical (rock, relief, climate, vegetation, groundwater and pedofreatică, anthropogenic influence and time) that overlap and influence each other, causing the manifestation of pedogenetical processes specific, leading to the formation horizons soils.

The main pedogenetic processes found in the area studied are: bioaccumulation, carbonation, argillic alteration, clay migration, gleyzation and stagnogleyzation, salinization and alkalization.

5.2. Genetic soil types and subtypes

Taxonomic classification and characterization of pedologic cover of the middle basin of the Prut, between Tutora and Gorban, was based on soil studies prepared by OJSPA Iasi, in scale 1: 5,000 and 1: 10.000, 7 Administrative Territorial Units (ATU), namely: Tomesti, Comarna, Costuleni Raducaneni, Mosna, Cozmesti and Gorban, with our contribution to the territorials of Comarna and Mosna (figure no. 10).

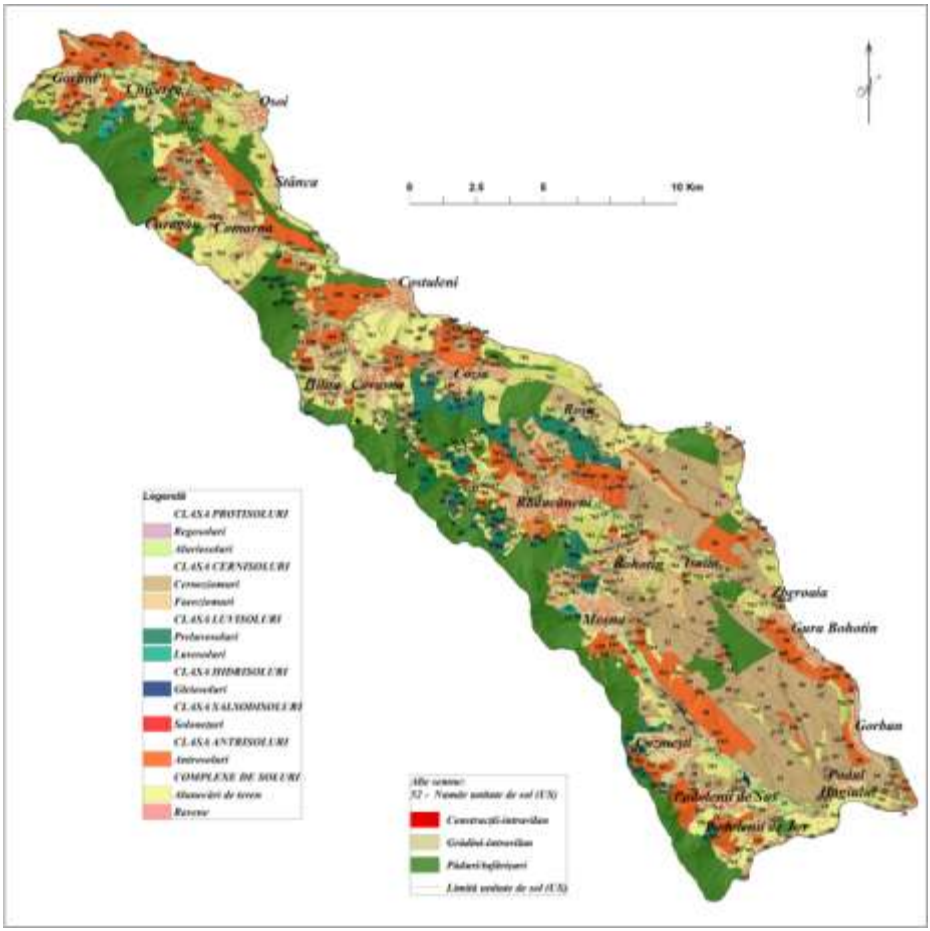


Fig. 10. Soil map units (US) Front of the Prut.

Soils in class cernisoils have the largest share, 53% (9,995 ha) of the area mapped, followed by the class antrisoils 28% (5.234 ha) luvisoils 14% (2,539 ha), protisoils 5% (984 ha), hidrisoils 0.13% (24 ha) and salsodisoils 0.03% (6 ha).

In the regional soils, (figure no. 11) Chernozems clearly stand out with 8.907 ha (47%), being followed by anthrosols on 5.234 ha (28%), preluvisols on 2,420 ha (13%), faeozems on 1,088 ha (6%) and luvisols on 119 ha (0.63%).

Among the zonal soils and intra-zone, fluvisols occupies a considerable area of 969 ha (5%), after which include gleiosols 24 ha (0.13%), regosols 15 ha (0.08%) and solonetzs 6 ha (0.03%).

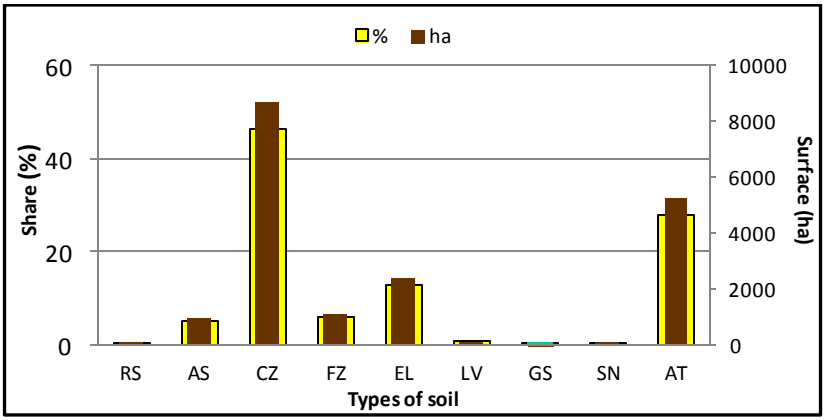


Fig. 11. The distribution of soil types in the middle basin of the Prut.

5.3. Considerations on soil productivity and employment quality classes

The analysis of 18 indicators involved in establishing evaluation notes at the level of the ground (US) found that 14% (2,657 ha) of the area mapped pedologic returns land classified as Class II quality arable land.

These are the lithological-structural plateaus, the back slope degraded and hilltops.

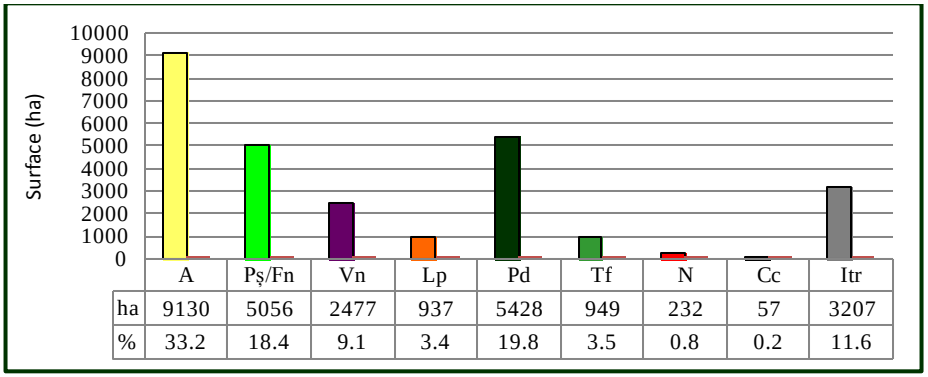
Half the land (9165 ha) falls into Class III quality arable predominant class and the entire county Iasi. It encompasses most of the back slope and is followed by class IV quality with a share of 21% (3,892 ha) and grade 16% (3,068 ha) on the cuesta front but here back slope includes the highly degraded.

6. Land use

Farmland in the study area extending over 17,600 hectares representing 64% of the total or 4.7% of the agricultural area of Iasi County, the 376 456 ha.

Figure no. 12 shows that the total area of the hills in the middle basin of the Prut, from 27 473 ha, the largest share (33.2%) is arable land.

These are followed by land occupied by forests (19.8%), pasture / hay (18.4%), urban area (11.6%), vineyards (9.1%), shrubs (3.5%), orchards (3.4%), non-productive land (0.8 %) and construction outside the municipalities (0.2%).



	A	Pş/Fn	Vn	Lp	Pd	Tf	N	Cc	Itr
ha	9130	5056	2477	937	5428	949	232	57	3207
%	33.2	18.4	9.1	3.4	19.8	3.5	0.8	0.2	11.6

Fig. 12. Land use in the middle basin of the Prut.

7. The main correlations pedo-geomorphological

Although in previous chapters of this paper have made many connections between soil cover and genetic types and forms of relief, it considers it appropriate in this chapter highlight the most significant links between geomorphic particularities and soils in the study area.

Following the distribution of soil types classes slope is observed large share of chernozems (68%), phaeozems (80%) and anthrosols Arica (72%) on land with a slope of under 18%, while preluvisols and luvisols (57%) and anthrosols eroded (63%) occupy the higher areas with slopes greater than 18%.

Soils with high humus reserve the moderate and held the largest share, 42% (7972 ha), of which 2606 ha (33%) on the slopes ≤ 5%, 5.001 ha (63%) on the slopes of 5-27% and 365 ha (4%) slopes> 27%.

Following the distribution of reserves of humus class downhill found very high percentage (81-82%) soils with high humus reserve and extremely large (1,052 ha of the area mapped pedolgic) on slopes of less than 5%. The largest area of soils in the

investigated area has reserves of humus and small, which represent 52% (9,758 ha) of the area mapped pedologic. In this area, only 1.383 ha (14%) overlap the slopes ≤de 5%, the rest of 7.403 ha (76%) are the gradients of 5-27% and 972 hectares (10%) slopes ≥de 27%.

Values soil reaction (pH) are more affected by physical and geographical conditions. In the north the soils are more neutral mildly alkaline or pH 5.9-6.8 15% to 38% with pH 6.9-7.2 and pH 7.3-8.4 with 46%. In contrast, the hilltops and cuesta front of the southern soils are slightly acidic, mildly alkaline, ie pH 5.9-6.8 30%, 19% with pH 6.9-7.2 and 48% with pH 7.3 -8.4.

Analyzing erodability on soil types found in soil erodability decrease preluvisols and luvisols with the most unfavorable physicochemical properties, the faeozems and chernozioms. Thus, 66% of preluvisols and luvisoils erodability is very high and excessive while for 65% and 67% of faeozems chernozioms erodability is medium-low, which can add 99% erodability anthrosols middle. Soil texture is the main natural feature of the solid component, with particular role, both in soil genesis and evolution, and in appreciation of most of the physical or chemical characteristics, conditioning and direct some features agrotechnical ameliorative (C. Rusu, 1998). Setting texture horizon „A“ and the control was based on data from 110 soil profiles representative of the area studied, analyzed in the laboratory from OJSPA Iaşi. Thus, in the northern clay and clay loam deposits, relief and more pronounced denudation processes (landslides, surface erosion), loam-clay (33.3-45.0% clay) is more obvious in section control. It occupies 66% of the soil survey compartment north (7146 ha), while the average loamy texture (22.6-31.5% clay) is only 30%.

On the other hand, in the southern section, deposits loess and loess clays in higher proportions than clay and clay loam deposits, led a balanced content between particle size fractions. Therefore, 64% of the soil survey (11.636%) have medium texture and 28% fine textures in the control

8. Conclusion

The area studied represent a cutting from the right slope of the river Prut Valley located in the eastern part of Moldavian Plateau, more precisely on the northeastem border of the Central Moldavian Plateau.

From the geological point of view, the area studied is part of the Moldavian Platform area, from whose sedimentary cover denudation processes revealed formations Bessarabian (Middle Sarmatian), Chersonian (Upper Sarmatian) and Meotian. The temperate continental climate with shades of excessively has an important role in triggering the current geomorphological processes, especially in thermal regime (average temperature of 8.2-10.2 ° C) and by the rainfall (565 mm average rainfall / year). The hydrographic network is made up of a series of right

tributaries of the Prut (Tătarca, Comarna, Covasna, Cozia, Ochiul, Moşna and Bohotin) who have developed small pools of reception that exceeds 8,200 ha each. Genetic type is predominantly sculptural relief (river-denudational) in general monoclinale structure, which holds a share of 79% in the studied area. Lithological-structural plateau hold a considerable share of 12% (3,180 ha) of hilly areal surface of the middle basin of the Prut. These plates remain today in the form of relief by erosion remmant (typical plateau) or smaller (structural bench), grafted harder rocks bassarabien, chersonien or meotien. The relief river accumulation is the smallest being extended only 9% of the area studied, as evidenced by poverty terraces on the right side of the Prut river and large development on the left side. Among the geomorphological processes that cause land degradation in the middle basin of the Prut stands surface erosion, gally erosion and landslides.

By applying Motoc model estimated that the average soil loss due to erosion on agricultural land area is 7.8 t / ha / year. Ravines covered surface is 878 ha, which represents 3% of total area. Although they hold a small share, ravines contributes to considerable fragmentation of the landscape, creating a favorable triggering mass displacement processes (falling and landslides).

Landslides are the most significant geomorphological processes that cause land degradation in the studied area. They cover an area of 14 998 ha, which represents 54.6% of the total area. Note that, in the context of climate warming occurred in the summer of 1982, stabilized landslides largest share of 97.2% (14 585 ha), while active landslides are restricted on 413 ha (2.8%).

According to the soil map were identified 9 types of soils that are part of the six classes of soils (SRTS 2012). The largest share have soils class Cernisoils occupying 53% of the mapped pedologic, followed by soil class Antrisoils (28%), Luvisoils (14%), Protisoils (5%), Hidrisoils (0.13%) and Salsodisoils (0.03%).

In the middle basin of the Prut agricultural area is 17,600 ha (64% of the total area) and non-agricultural area 9,873 ha (36%) of which were chartered pedologic 18.782 ha. The analysis of 18 indicators involved in establishing evaluation notes at the level of the ground (US) found that 14% (2,657 ha) of the area mapped pedologic fall into Class II quality arable, 49 % (9165 ha) in class III, 21% (3,892 ha) in the fourth grade and 16% (3,068 ha) in the fifth grade.

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