

JIIA'S UPPER CATCHMENT. PEDOGEOGRAPHICAL STUDY

- ABSTRACT -

CONTENTS

Introduction

Chapter I - Geographical location and general characteristics of the study area

Chapter II - History in Plain physical-geographical research hilly Jijia

Chapter III - Theoretical and methodological

III.1. Theoretical

III.1.1. Concepts and models of formation and evolution of soil

III.1.2. The concept of soil quality

III.2. Methodological issues

Chapter IV - The components of the natural environment - prerequisites for the formation and evolution of soil cover

IV.1. Aspects of the geology of the region

IV.1.1 . Lithology . Factor mineral soil component support

IV.1.2 . Deposits surface - soil parent material

IV.1.2.1 . Correlations between the nature of surface deposits and soil texture

IV.2. Relief

IV.2.1 . Genetic types and specific forms of relief

IV.2.1.1 . Structural and petrographic facies relief .

IV.2.1.2 . Relief river- denudational

IV . 2.1.3 . Relief accumulation

IV.2.1.4 . Geomorphologic processes

IV.2.2. Morphographical and morphometric aspects . Correlations between the main types of soil and morphometric variables

IV.2.2.1 . Morphographical

IV.2.2.2 . Altimetry

IV.2.2.3 . The slopes

IV.2.2.4 . The drainage depth

IV.2.1.5 . Slope

IV.3. The climate

IV.3.1 . General aspects of genetic

IV.3.2. Features of the main climatic elements

IV.3.2.1 . The air temperature

IV . Rainfall

IV.3.3 . The involvement of climatic factors in pedogenesis

IV.4. Water Resources

IV.4.1 . Hydrological conditions

IV.4.2 . Groundwater

IV.5. Biotic factor

IV.6. Anthropoc and land use

Chapter V. Soil cover - reflection of pedogenesis conditions of the region

V.1. The main soil – formation processes

V.2. Taxonomic classification and spatial distribution of soil

V.2.1 Classes and soil types

V.2.2. The distribution of soil types and their characteristics

Chapter VI - The quality of agricultural soils

VI.1. Analysis of the physical parameters of soil quality

VI.1.1. Texture

VI.1.2. Textural differentiation index

VI.1.3. Tack Index

VI.1.4. Bulk density

VI.1.5. Porosity

VI.2. Analysis of soil quality parameters hydro

VI.3. Analysis of chemical parameters of soil quality

VI.3.1. The content of organic matter

VI.3.2. Soil reaction

VI.2.4. The content of nutrients

Chapter VII - The productive potential of land

Conclusions

Appendix: Indicators ecopedological

Bibliography

Keywords: soil quality, potential of production, physico-chemical indicators, uppers basin of Jijia, pedogeographical study

Introduction

Identify properties of the soil cover and knowing the behavior of soils under varying usage are the main two axes on which may provide directions optimally utilize these resources while maintaining environmental stability.

Need to know the specific geographical features Jijia upper basin is relevant for the analysis of knowledge and interpretation of soil cover, while its interaction with other natural ingredients. Analysis of the main variables, such as geological support, relief, hydro-climatic component and the connection was made biogeographic areas of interest, located at the transition of two physical-geographical subunits, respectively Suceava Plateau hilly and plain Jijia and base, position the determines a specific conditioning all geographical factors.

Geographical location and general characteristics of the study area

Jijia upper basin is located in the north west of the Moldavian Plateau , to the line of contact between Suceava Plateau hilly and plain Jijia and base, covers an area of 265.79 km². The general direction of the river basin is NNW - SSE , which causes a specific preparation of morphology and morphometric in the landscape . The maximum length of the pool in this direction is 28 km and the average width is approximately 21 km.

Jijia River flows from the territory of Ukraine, Bull Mountains , in the locality belonging Turyatka Chernivtsi region , at an altitude of 410 m from the spring until the settlement Dorohoi Jijia has a length of 28 km . Jijia upper basin is between coordinates 48°05'09" and 47°51'27" north latitude (southernmost point in the locality Văculești) and longitudinal is located between 26°25'54" and 26°10'11" east between saddle alignment Dersca - Lozna and Ibănești Coast (west and northwest) and Jijia Plain in the east .

Components of the natural - prerequisites for the formation and evolution of soil cover

The dominant feature of this area is the fact that colluvial slopes are active morphodynamic customize a complex landslides and subsidence processes are dominant, followed by surface erosion. Clearly exhibition slopes west and south-west cuesta nature of the most intense soil degradation processes, but the manifestation and the intensity of these processes depends mostly on how land use. In the upper basin Jijia dominant feature of the landscape is given by colluvial slopes, customize an active and complex morphodynamic processes are dominant landslides and subsidence, coupled with the erosion surface. Widespread development of land degradation in the region is influenced by favorable natural conditions, the irrational use of land, closely related to a type of agricultural practice individual, petrographic composition dominated by clay-marl facies with alternate sandy, sometimes with sandstone and calcareous clays and marls wet plasticity. Variation and intensity of current geomorphological processes are directly proportionate to the nature lithologic deposits and initial conditions are added to the relief morphology, represented by geodeclivitatea, slope length, energy and horizontal fragmentation. Need to know the specific features geomorphometry Jijia upper basin is relevant for further study of current geomorphological processes and changes in pedogenesis.

Crucial role in shaping climate and soil distribution is widely recognized. Although he sometimes spoke of equal importance pedogenetic factors, the climate has always been considered a crucial factor, taking into account that it makes the characters and spread a very important factor, the biological.

Jijia River has its source in Ukraine , Bull hilly eastern slopes of the massif . Longitudinal slope of the first kilometers of riverbed is 13 m / km , and the slope gradient is characterized by higher values of 10°, that surface runoff is very active. Near Dorohoi as important confluences Pomârla streams, Buhai and stream returned plains are wide and wet , especially in the hearth former lezer Dorohoi, currently under redevelopment. In the upper basin (upstream of Dorohoi) Jijia is a third order river (the Horton - Strahler hierarchy) to the confluence with Pomârla, then the order IV, to the confluence with the bull and then the order V (up to Dorohoi). The climate of the region represented by average annual temperatures between 8°-9°C and average annual precipitation increases from 500 to 650 mm , determine the installation of steppe vegetation and oak forests .

The current mode of land use shows that the forest still occupies about 36 % of the territory (9626.87 ha), represented by deciduous species, the predominant hardwood. Given the spread areas of soils Silvestre (Class Luvisols) (approximately 40%) that the forest was more extensive than today. Once the forest is the share of arable (27%), plus the percentage of arable use complex (gardens), with 8%. Unfortunately, for this use (arable) land processing of unfavorable culture contributed and contributes to progressive loss of soil quality plan. Correlations established between the main categories of use of the current mode, indicates the highest percentage for arable space, this uses the specific classes being cernisoluri and Luvisols with approximately equal percentages (60%) and protisolurile antrisolurile are typical areas covered by pasture, while the larger surfaces on which the extended gardens (arable complex) are the most prevalent class protisoluri soil, the type regosol .

Pedologic shell - a reflection of the conditions of the region pedogenetical

To characterize the soil cover soil studies were used by OSPA Botosani (6 Dorohoi communal areas). Older studies were designed in accordance with SRCS, 1980, and the latest in accordance with SRTS, 2003. For all these studies were conducted reambulating soil and translating the vision SRTS 2012. In the upper basin Jijia identified 10 genetic soil types belonging to 7 classes of soil are divided into subtypes based taxonomic units and their principal subdivisions (species diversity and soil texture) and soil map includes 231 the ground unit.

The quality of agricultural soils

Since this work aims at defining how the natural environment can provide support pedogeomorfologic quality and sustainable land use in relation to all the physico-chemical soil characteristics were monitored Ap horizons, I or Ao. The classification was made according to key indicators Methodology develop soil studies (MESP) developed by ICPA Bucharest (1987). Based on the composition of particle size, bulk density and total porosity, which is the basic physical characteristics, has preceded the calculation of a series of thresholds (value) of humidity, which are designed to emphasize the significant changes in the mobility and the availability of water to plants. Indicators considered are: the coefficient of hygroscopic (CH), fading coefficient (CO), total water capacity (CT), the ability of useful water and drainage water capacity (CD). Chemical composition of soil quality is related to how well the soil meets the following functions: storage and gradual release of nutrients, buffering against rapid changes in habitat potentially toxic materials , recycling of organic material in the soil to release nutrientii the purpose of future synthesis in other organics .

Productive potential of land

Evaluating its potential production capacity of soils and land called bonitare, is a major groupings or classifications of the first agricultural soils.

The basic principle in land evaluation is to estimate the extent to which the characteristics of land meet the requirements of crops, soil work requirements and how landscaping.

Starting from information about casing soil and physico-geographical conditions play in a complex potential is estimated for different land use modules / recovery, or for different categories of use. The interpretation of analytical values presented through tabular material and the graphic and cartographic which showcases various qualitative categories of land extending them. To estimate international system was adopted evaluative 5 graded according to the intensity of the limiting factors and how these limiting factors associating with certain characteristics of the land, the practical importance.

Over the great diversity of natural conditions , thermal and hydro resources varied territory overlaps marked morphological differentiation and edafico - soil , eventually causing a system composed of homogeneous ecological areas .

Map of classes reflects the predominance of arable quality class III (41-60 points), in the central -southern part of the basin and in the eastern part of its contact with the forest, and interfluvial surfaces slopes with gradients reduced the spread of that area and

phaeozems chernozems. These are lands with significant functional limitations or a major intervention required. Also, favorable land are located in plain Jijia here soils with good drainage, medium texture, neutral or slightly alkaline reaction, characteristics that determine the quality and justifies their utilluarea as arable land. Extensive lands are of average quality, which received marks ranging from 41-60 points. They occupy about 3000 ha (25.3 %) of barley and about 3100 ha (26%) in the case of wheat , located in the lower course of the river Buhai , the Lower Back Brook in the central- western basin at the head of that river and west of the city Cănăpiștea Hilișeu Hen.

Thus, the parameters considered for evaluation marks geomorphometry land slope stands a huge influence on the qualitative aspect of pedological cover. Slope is a controlling factor for development of erosion processes but also for a range of physico-chemical properties of the soil cover, respectively reserve humus content and volume of edaphic good nutrient content, depth of occurrence of carbonates. Moderate restrictions appear apple, apricot, peach and grape vines, these cultures are better uses anti-erosion protection, so that the slope significantly reduce their influence. Moreover, the current geomorphological processes, landslides are those that have an important role in influencing agricultural use.

Conclusions

Jijia upper basin by the general appearance of hilly plains and valleys fragmented pedogenetic conditions representative reflects major features specific physico-geographic unit to which it belongs, located at the contact between the hilly plain Jijia Suceava Plateau to the east and the west.

Research conducted in the basin had as its starting point an extensive bibliographic documentation we provided the information necessary for understanding the functional relationships between physical-geographical factors and characteristics of the soil cover and the pedo-geographical features of the study area.

From the methodological standpoint, were used both conventional methods specific soil science research and statistical methods and techniques for spatial prediction pedological parameters or other variables of interest.

Physico-geographical factors were analyzed through the soil features that prints and how they contribute to the genesis of the soil cover, that each component of the natural relationship with pedological cover. Research carried out in the study area showed decisive influence soil formation and evolution of pedogenetic factors traditionally considered subordinate or "passive" than others.

Regarding the geological substrate, most of the territory is carved volhiniene formations and unconsolidated sedimentary rocks (clays and marls) influences evolutionary processes of pedogenesis and soil. Representative of the study area are fine textures, specific to 80% of the soils were classified into 7 classes and 10 types, the dominant class is the common frame of Luvisols northwestern basin, followed by cernisolurilor found in the low . The latter is characterized by a high degree of fertility but is varied in the micro-and mezoreliefului. Also, the presence of local factors relevant to the pedogenetic, an idea supported by antrisolurilor development on slopes with gradients higher hidrisolurilor on the alluvial plains, as well as in areas with argilozitate vertisolurilor pregnant.

The close correlation between topography and soil cover was analyzed using morphometric parameters, highlighting their importance in the process of mapping. Also, differences were found between the climate northwestern and central-eastern part of the basin, forming the separation of areas considered relatively homogeneous in terms of climatic

parameters (ACO). This is explained by altitudinal zonation on higher level Luvisols, in an area characterized by low temperatures and high rainfall quantity, while cernisoluril class is found in the central-eastern characterized by a microclimate with temperatures relatively high and low precipitation.

Regarding the suitability of land for major crops in the basin, namely maize, wheat and sunflower, it is found that the most favorable land are located in the middle basin, on cliffs and slopes slightly inclined, and in plain Jijia on soils with drainage good, neutral and weak alkaline reaction, characteristics that determine the quality and justifies their use as arable land. The main factors limiting agricultural production capacity of the land in the catchment area Jijia are erosion, landslides, reduced nutrient content, or for some types of soil humus.

These are the results of a research and applied descriptive themes that aimed primarily attempt to capture the complexity of processes and phenomena specific soil cover in a well-defined, as Jijia upper basin.