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Research on the calculation of work required for development of the hydrographical basin in Unit VII Coltan

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Abstract Torrential corrections in hydrographical basin needed because of the beneficial effects they can produce. One of them is that if they are needed storage dams some torrential correction, namely the construction of dams breaking pressure and to stop silt brought by rivers that reach the bottom of the dam and its yield would decrease dramatically. We did some calculations which show that the most profitable are those torrential correction works only if it is clean these dams silt bottom.

Key words

hydrographical basin, torrential correction, morphological parameter, maximum flood flow, catchment's rainfall

Another effect of torrential correction should be to protect social objectives, economic, localities that have high risk of flooding. Through these works torrential correction may improve often even eradicate river out of bed for long-term rainfall, as the construction of dams breaking pressure or by building dams. That's also a beneficial role would be and where slopes have been deforested or irrational cuts were made and where can arise very powerful torrents that without those papers torrential correction could lead to landslides, erosion or other forms of destruction of soil.

Bârzava torrential basin is located in Unit VII Coltan with an area of 1215,2 hectares, is part of Bocşa Montana Forest included in Forest Department Reşiţa, Romsilva. The unit is within range of Bocşa and Reşiţa (Town Monium) in Caraş-Severin. Geographically, Unit VII Coltan is situated on the left side of the river Bârzava between town and city Monium Bocşa. Bârzava catchment's area is 160 ha and is the 60% component of forest. The total length of the river is 2850m; bed length principle of the total length of the river, the main river bed has a length of 2100m. First order tributaries length is 200m, second order tributaries length is 800m and third-order tributaries length is 1100 m.

The entire area of land that comprise forest basin is in public ownership and is managed by the Forest Bocşa Montană, in the Directorate of National Forestry. This administration is under the Forest Code (Law no. 26/1996). Bârzava basin geographic length is 2850m. Administrative length of the bed is 2100m. Bârzava River flows from Semenic Mountains and the catchments area is buffered so you Docnecei Mountains. Hydrographic network is represented by River Bârzava with the following main valleys: Valley local Locai, Ogasul Kings and Buchin Valley.

Material and Methods

From studies made in the field and using Haiti as a result of geological parent rock of the most important production unit are: micashist (metamorphic rocks), generating luvic brown soils, deep in the middle generally rich in nutrients, often sandy loamy rapid disintegration processes; sandstones (sedimentary rocks) which soils formed by weathering easy brown relatively rich in skeleton small, easily exposed leach ate from middle to high productivity forest vegetation.

From a climate perspective, the region under study is located in the temperate continental climate with Mediterranean influences. Winters are mild and not too long springs rich in precipitation and relative times, warm summers and long autumns and dry. The continental climate is emphasized. After Romania's climate zoning, the studied region can be classified as moderate continental climate IBp4-climate (annual precipitation amounts larger and smaller thermal amplitudes) the specific hills and forests on the hills of Dognecea vegetate after Köppen, district territory belongs to the province Dfbx climate in which "C" - the average temperature of the hottest month is less than 10°C, warm temperate winters; "F" - precipitation throughout the year; "B" - the average temperature of the warmest month below 22°C, but for at least 4 months per year above 10°C;"X" - Maximum rainfall in summer, late winter minimum. Climatic conditions hillside terrain with slopes wavy shape formed on sedimentary rocks and metamorphic caused formation of soil type's characteristic of the area taken in studio.

Thus, within the Unit VII Coltan with specific trees forest hills area (European beech forest, European beech-sessile oak mixed stand, hill mixed hardwood forest with oak and beech, oak hill traces of oak and evergreen and seek pure) offers various training pedogenetic soil conditions. We studied 17 field main soil profiles located so included all existing content production unit. They made some soil profiles: 2B, 5A, 7B, 8B, 1 IA, 13A, 15A, 17A, 18B, 20A, 21, 22A, 23A, 41, 59b, 63C, 70A. We have sent to the laboratory soil analysis of soil profiles in our university.

About 92% of the trees (fundamental natural, artificial, which are planted with oak and various countries and partly derived) use well silvoproductive potential of the resort. Due to non timely care work, it was where trees are 8% of total derivative and partial derivative 4%. Middle and higher productivity artificial stands are plantations of softwoods, oak, and species mix: lime, ash, cherry. Proportion of the main species (GB, Fa, Ce, Gi) is 58%, the remaining 42% are various species of mixed species. Future management of water stand will focus maintaining and promoting basic primary species: sessile, flasks, sky, beech and ash, cherry, maple - species of high economic value.

Stations were set up according to all the physic-chemical conditions of soil and surfaces. Of physical-geographical conditions, the most important are: relief wavy; exhibition partly sunny; altitude 170-460 m.

Soil - litho logic substrate consisting of alternating, clays, marls and sandstones;-mull or mull humus type-moderate-are good ability to transfer water. The frequency rainfall and their evolution in time are closely correlated with land use in the catchments torrential content. It is therefore necessary to describe in more detail how an all categories of uses and their inventory by identifying and measuring them according to the situation. It must also make a description based on personal observations of the behavior of these uses. For qualitative hydrological mapping of land we use qualitative hydrological mapping system, basin morphology, pool surface (F).

This is a fundamental morphological parameter because it comes directly or indirectly in all hydrologic calculations, influencing its size, in one way or another scale and dynamic degradation, forming torrential floods and silt transport. Basin area is 160 ha. As the liquid flows maximum flood values depend on the probabilities associated with these values is necessary first to establish these probabilities. According to current standards of flood forecast maximum liquid flow generated by rainfall on small basins and will be forwarded to the following probabilities of exceeding:

1. Probability calculation works properly in normal operation;
2. Play probabilities corresponding special operating conditions of the unit objectives.

Small-scale faults are allowed and may be removed or repaired without removing the goals that must be defended. In both cases, ensuring maximum flow is determined by the weight class that is designed to work in the basin studied, and this class is determined by reference to the category of important objectives endangered by floods.

Construction of water reservoirs for hydropower, land improvement works of settlements, the lines of communication are considered and classified as state standards. For compliance, will take into account the duration of expression of the work, is permanent or temporary, and their functional role, is primary or secondary. Expressions of interest in other morph metric parameters, in particular those which quantify the effect of shape hydrological basins Bârzava basin perimeter resulting from planimeters is 7.680m.

Results

Orders river are some numbers that is assigned after a certain rules a whole considered the origin whites to spillage or a channel segment between two confluent. Scientific importance and systematic practice of river networks flow from the fundamental principle of variation jumps. This principle implies that two whites that formed downstream of the confluence join them one nine channel presenting qualitatively different from the beds that generated it.

To establish Order River we use Strahler's system. Assign terminal segments of Order I do not get tributaries. Segments resulting from the union of two segments of Order I have to deal with second order segments. Segments resulting from the union of two segments forming the second order third order segments. The union of two segments of different orders kept senior segment. Systematic ordering of the river system serves hydrological calculations. Order a criterion for stratification hydrographical basin in morphometric and hydrological studies as follows first order, second order, third order.

To remove the bias introduced morphometric and hydrological calculations by the maximum length of the basin are used to determine and use in calculations of average length of the basin, denoted L_b. For this basin Bârzava is assimilated to a rectangle, of the same area (F) and the same perimeter (P_b) in the basin considered.

Applying this formula is to obtain the average length of 2850m Bârzava river basin. Quantitative expression of the form basin plan involves comparing its shape with a geometrical figure reference. Consider a hypothetical circular basin, whose surface is equal to the basin studied by comparing actual basin perimeter (P_b). This reporting relationship is obtained coefficient of Gravelius.

$G = P_b / P_r = 1,71$ - elongated basin is very strong.

It plays a major role in the whole basin morphometric parameters.

The average altitude of the basin makes streams of matter and energy content of torrential basins and influence of these basins hydrological cycle and potential mechanical energy expressed relief in the emergence and development of torrential processes.

Because the basin is a small pond, relatively homogenous in mind, the average altitude of the basin can be determined using the formula:

$H_{med} = H_{min} + H_{max} / 2 = 1400 + 500/2 = 825m$

The significance of hydrological and technological order and the frequency with which they engage in various calculations, the slope is central to the whole river basin morphometric parameters.

Basin slope triggering condition and development torrential phenomena and for determining or adapt many of the elements of design, calculation procedure is based on slope relationship between successive contour lines, slope basin-wide (Ib) and obtain the formula $Ib = \Delta H / F \times \Sigma l_i$

ΔH – the gap between two successive curves.

l_i - sum contour lengths.

Table 1

Contour length of the hydrographical basin

Contour length		
1/700	240	m
2/800	280	m
3/900	320	m
4/1000	360	m
5/1100	400	m
6/1200	440	m
Total	2040	

I_b = 40/l 600000 x 2040 = 0,05 - slope = 5%

Is one of the parameters on which time of concentration of runoff in the basin and the amount of erosion on the slope. At the same time it is a very good indicator of drainage. By calculation can find the maximum length of slopes which are real long or medium length calculation length of slopes which although has valence shell morphometric and hydrological incontestable order.

The maximum length of a river basin slope is represented by the largest component of slope length. Thus, a site plan with contours, each of these lengths are measured as the largest slope line which connects the river system and watershed runoff revolving topographic slope that separates slopes of considered adjacent. In calculating the average length of slopes using the method proposed by Horton who could live with one hypothetical rectangular basin with the same surface hydrographic network which is equal in length to the complex basin considered.

Thus, we obtained two slopes hypothetical whose lengths are equal to the average length of actual basin slopes. Calculating the slope length is the hydrological significance level is given by the length fictitious versions with the main bed of the basin determines the average concentration of runoff in the basin.

$L_{cv} = F/2L_r$ = l600000 / 2 x 2850 = 280 → basin's classification of Clinciu as falling within large basins.

$L_r = L_b$

Rational formula generated by a downpour is expressed as:

$Q_{max} = 0{,}167 \times F \times C \times i_{iqo}$;

C-coefficient drainage basin average (0,75);

i_{iqo}- average rainfall intensity probability calculation with equal duration time of concentration of runoff in the basin;

F - basin area in ha.

The mean concentration of runoff is the time in minutes required water flow to the distance between the farthest point and section for calculating hydrological basin.

$T_C = T_V + T_a$

$T_v = 0{,}5 \times L_v / I_v$.

Flow curve variation with respect to time is elementary flow unit hydrograph considered. It is based on the method developed by Gaspar and Apostle, and thus the amount of silt is projected separately trained separately drainage on slopes and drainage volume of silt on the riverbed trained.

W_{av} - average slope sediment transport;

W_{aa} - year average volume represented by silt bed;

$W_{av} = a \times b \times \sqrt{I_v} \times \Sigma F_i \times q_{vi}$

a = dimensionless coefficient = 1,17;

b = coefficient of volume reduction of silt = 0,77986;

$I_v = I_b$ = slope slope;

Q_{vi} = specific surface erosion index of USH sites.

Table 2

Number of orders in the hydrographical basin, area 1

No.orders	USH	q_{vi}	F	F x q_{vi}
1	1	0,5	45	22,5
2	2	1,25	65	81,25
3	3	2	50	100
Total		3,75	160	203,75

W_{av} = 1,17 x 0,77986 x A/),05 x 203,75 = 1,17 x 0,77986 x 0,22 x 203,75 = 40,89;
$W_{aa} = b \times \Sigma(L_i \times q_{ai} \times \sqrt{I_{ai}} \times I_i)$;
b=0,77986;
L_i = length of channel sector, the same character throughout its length;
q_{ai} = index of erosion in Section I;
I_i = the standard slope beds;

Table 3

Number of orders in the hydrographical basin, area 2

No.orders	L_i	I_{ai}	I_i	Q_{ai}
1	200	0,28	0,135	0,25
2	800	0,24	0,128	0,275
2	1100	0,156	0,120	0,3
Total	2100	0,676	0,383	0,825

W_{aa}= 0,77986 x (2100 x 0,825 x √0,676/0,383) = 1794,27;
$W_a = W_{av} + W_{aa}$ = 40,89 + 1794,27 = 1835,16;
$W_{al}^{\%}$ = transportation of sediments by heavy rain;
$W_{al}^{\%} = 10 \times b \times C \times F \times H_{1\%}$;
b = 16,89;
C = weighted average of the pool drain = 0,5;
F = surface in km^2 = 1,6;
$H_{1\%}$ = precipitation layer height to provide 1%= 1867;
$W_{al}^{\%}$ = 10 x 16,89 x 0,5 x 1867 = 252269,04;
$Wa^{ator} = A \times W_{av} + B \times W_{aa}$;
A = 0,2;
B = 0,6;
Wa^{ator} = 0,2 x 40,89 + 0,6 x 1794,27 = 8,178 + 1076,56 = 149.113,12.

Conclusions

A final conclusion to prevent, correct or diminish their training is necessary for these works to promote torrential correction becoming more especially in our country where disasters have increased following forest cutting wasteful and failure to comply with the laws of nature. In Bârzava basin have not been made correcting papers torrents

In terms of hydrology, the impact was not felt at all, because they have blocked certain sections of river basins giving rise to accumulation typically used to produce electricity and to irrigate agricultural areas drier. As noted above, the table values, the largest pool of storage is used for recreation.

But we part and a negative impact on the environment. The construction of this reservoir was abandoned a good part of the slopes, they are dynamic and thus came to an imbalance between wildlife and vegetation. On the other hand this sacrifice was beneficial downstream area. Due to large beds and populated in large amounts of rainfall and sediment would be powerful enough to flood. In plain terms this sector is still possible impoundment dams are few in number and are becoming increasingly rare.

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