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ODRŽIVO ŠUMARSTVO

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EROSION PROCESS IN LOCALITY MEDENOVAC-KARAVANSALIJA IN ROGOZNA

Mihailo Ratknić, Svetlana Bilibajkić, Sonja Braunović¹

Abstract: This paper deals with the definition of the condition of the erosion process in the area Medenovac-Karavansalija in Rogozna and calculation of the mean annual erosion sediment yield and discharge. Since the mean coefficient of erosion for the area Medenovac-Karavansalija in Rogozna is $Z=0.282$, this area can be classified into the Category IV of the destructiveness. According to the type of the erosion surface and combined erosions are dominant, whereas deep erosion is present sporadically. The total sediment yield in the area Medenovac-Karavansalija is $W_{\text{annual}}=17172,32 \text{ m}^3\text{year}^{-1}$, whereas the annual specific sediment yield is $W_{\text{spec}}=291.99 \text{ m}^3\text{year}^{-1}\text{km}^{-2}$. The sediment discharge which refers to the area Medenovac-Karavansalija is $V=6796,19 \text{ m}^3\text{god}^{-1}$, and the specific quantity of sediment, i.e. quantity of the sediment per 1 km^2 of area is $V_{\text{spec}}=115.56 \text{ m}^3\text{km}^{-2}\text{year}^{-1}$. According to the calculated coefficient of erosion Z , sediment yield and discharge in the area Medenovac-Karavansalija, the most typical category of erosion is weak erosion.

Key words: erosion processes, coefficient of erosion, sediment yield, bedload and suspended sediment discharge

EROZIONI PROCESI NA LOKACIJI MEDENOVAC – KARAVANSALIJA NA ROGOZNI

Izvod: U ovom radu definisano je stanje erozionih procesa na području Medenovac – Karavansalija na Rogozni i obračunata je srednje godišnja produkcija i pronos erozionog nanosa. Srednja vrednost koeficijenta erozije za područje Medenovac – Karavansalija na Rogozni iznosi $Z=0,282$ pa se područje može svrstati u IV kategoriju razornosti. Po tipu erozije preovlađuju površinska i mešovita erozija, dok je dubinska prisutna sporadično. Ukupna produkcija nanosa na području Medenovac-

¹ Mihailo Ratknić, Ph.D, Svetlana Bilibajkić, M. Sc, Sonja Braunović M. Sc, Institute of Forestry, Belgrade.

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Karavansalija iznosi $W_{\text{god}}=17172,32 \text{ m}^3\text{god}^{-1}$, a srednja specifična produkcija nanosa je $W_{\text{spec}}=291,99 \text{ m}^3\text{god}^{-1}\text{km}^{-2}$. Količine pronosa nanosa koje se odnose sa područja Medanovac-Karavansalija iznose $V=6796,19 \text{ m}^3\text{god}^{-1}$, a specifična količina nanosa tj. količina nanosa koja se odnosi sa 1 km^2 područja iznosi $V_{\text{spec}}=115,56 \text{ m}^3\text{km}^{-2}\text{god}^{-1}$. Na osnovu sračunatih vrednosti koeficijenta erozije Z , produkcije i pronosa nanosa na istraživanom području Medanovac – Karavansalija najzastupljenija kategorija erozije je slaba erozija.

Ključne reči: erozioni procesi, koeficijent erozije, produkcija nanosa, pronos vučenog i suspendovanog nanosa

1 INTRODUCTION

The phenomenon of soil erosion is one of the oldest problems of the human civilization. The problems of erosion and soil loss can be traced back to the beginning of agriculture. In recent times, the problem of soil erosion has occurred more frequently, due to the increase in population and agricultural pressure. This paper deals with the definition of the condition of the erosion process in the area Medanovac-Karavansalija in Rogozna and calculation of the mean annual erosion sediment yield and discharge.

2 INVESTIGATED AREA AND WORK METHOD

The investigated area is located in the territory of the following cadastral municipalities: Banja, Lopužnje, Bare, Negotinac, Brđani, Odojeviće, Vučja Lokva, Rajetiće, Izbice, Trnava, and Kašalj and covers an area of 58.81 km^2 . It is limited by the following coordinates of kilometer network (i.e. North latitude and East geographical longitude): along X-axis: 4 764 928 – 4 777 075, along Y-axis: 7 465 575 – 7 474 603.

The relief of area is made of low, medium and high mountain terrains. The belt from 900 to 1,200 meters above sea level accounts for 83.43% of the territory, the belt above 1,200 meters above sea level accounts for 4.41%, and the belt below 800 meters above sea level accounts for only 2.96% of the territory.

The greatest part of the investigated area, i.e. 70.61% has the angles of inclination of the terrain from 15 % to 30%. The inclinations from 6 % to 15 % cover 28.64 % of the area, and the area with the inclinations from 0 % to 5% cover 0.75% of the area.

The sunlit slopes, south and southeast exposures account for 16,66% of the territory, neutral exposures account for 40.35% of the territory, and cold exposures account for 32.99% of the area.

The climate with the expressive continental characteristics is typical for this area.

The formation of mainly shallow to mid-deep soils on the different bedrocks with the different percentage of skeleton is conditioned by the relief of the area.

The basic soil types registered in Rogozna are: limestone (Lithosol), syrozem on loose bedrock (Regosol), colluvial soil (Colluvium), eutric ranker, dystric ranker, eutric brown soil (Eutric cambisol), acid brown soil (Dystric cambisol), illimerised soil (Luvisol), marshy-gley soil (Eugley) and recent alluvial deposit (Fluvisol).

Soil erosion belongs to the group of the most widespread processes which is the result of the interection of the large number of factors and the study of it requires inter-

discipline approach based on the analytical and synthesis level. The complexity of this process points to the application of the complex methodology which is based on cartographic, teledetection and empirical methods.

By cartographic methods, based on the topographic map, the necessary numerical data were obtained: area of the total territory, areas and circumferences of watersheds and subwatersheds, flow length, mean altitude, medium slope of drainage basin, flattened slope of flow, etc.

By the analysis of geological and pedological maps, as well as by field research (taking samples of bedrock and soil and the laboratory analysis of them) the necessary data on geological and pedological base were obtained.

The teledetection methods based on the analysis of satellite photos combined with the detailed recognition of the terrain were applied in the method of the spatial definition of the intensity of erosion.

The empirical methods were used for the calculation of the mean annual bedload and suspended sediment yield and discharge.

The empirical form of Professor S. Gavrilović is most frequently used in our scientific and professional practice:

$$W \text{ year} = T \times H_{\text{god}} \times \pi \times \sqrt{Z^3} \times F \quad \text{m}^3 \text{ year}^{-1}$$

For the determination of coefficient of erosion Z the analytical method of Professor S. Gavrilović was applied:

$$Z = Y \times X \times a \times (f + \sqrt{I_{\text{sr}}}) \quad \text{m}^3 \text{ year}^{-1}$$

The analytical method of Professor B. Poljakov was obtained by the use of the diagram of the dependence between coefficients Z and a was also applied.

The ratio of bedload to suspended sediment was determined by the form of Professor B.V. Poljakov:

$$V = \rho \frac{M_0 F}{10^3 \gamma_1} \times 31.5 \times 10^6 (1 + \beta / \gamma_2) \quad (\text{m}^3 \text{ year}^{-1})$$

3 THE RESULTS OF THE RESEARCH

By the field visit and classifying of the investigated area it was determined that by the level of endangerment by erosion all the categories of destructiveness are present, with the different presence percentage.

Very weak erosion was reported on good grass and forest areas, on flat areas and the least inclined areas, regardless of the type and condition of the vegetation cover.

Table 1- *Erosion condition in the area Medenovac – Karavansaliija in Rogozna*

| The Category of Erosion | Area (ha) | % |
|-------------------------|-----------|-------|
| Excessive | 7.78 | 0.13 |
| Strong | 700.63 | 11.91 |
| Medium | 635.47 | 10.80 |
| Weak | 2680.93 | 45.57 |
| Very weak | 1858.71 | 31.59 |
| Total | 5883.52 | 100.0 |

The dominant category of erosion is weak erosion, which is reported on 45.57 % of the area. The high percentage of the areas subjected to the weak erosion is in the accord with the structure of the soil usage, since forest and grass areas, as well as the areas used for field crop production of gentle inclinations are dominant here.

The medium erosion is mostly found in the zones of the village areas in the areas which are used in field crop production, as well as in grass and forest areas of the lower quality, i.e. canopy.

The intensive erosion processes are not expressive.



Picture 1- *Extensive erosion*

By the data obtained by the detailed terrain recognition, analysis of the satellite photos, data on the geological and pedological base, climate factors, as well as data on the vegetation arrangement, the coefficient of erosion (Z) for the area Medenovac-Karavansaliija was determined analitically, by the separation of hydrological units (watersheds and inter-watersheds) by the methodology of Professor S.Gavrilović.

$$Z=Y \times X \times a \times (f + \sqrt{I_{sr}}) \quad (\text{m}^3 \text{year}^{-1})$$

where:

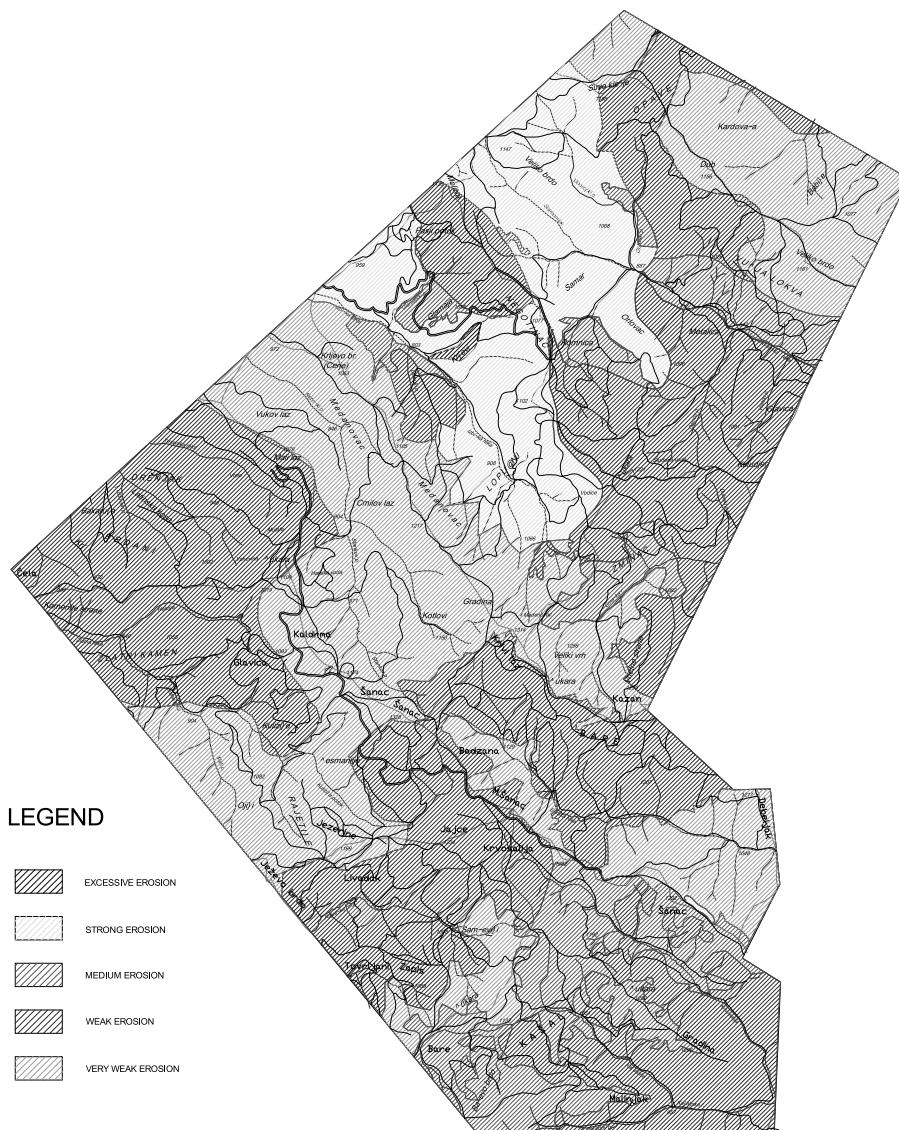
Y – is the reciprocal of the coefficient of soil resistance to erosion, depending of the geological base, climate and types of the pedological form;

$X \times a$ – is the coefficient of the arrangement of the watershed (area) and refers to the protection from the influence of atmospheric and erosion forces by the natural conditions, vegetation, etc. (coefficient X) or by the artificially created conditions, anti-erosive technical or biological works in watershed (area) (coefficient a);

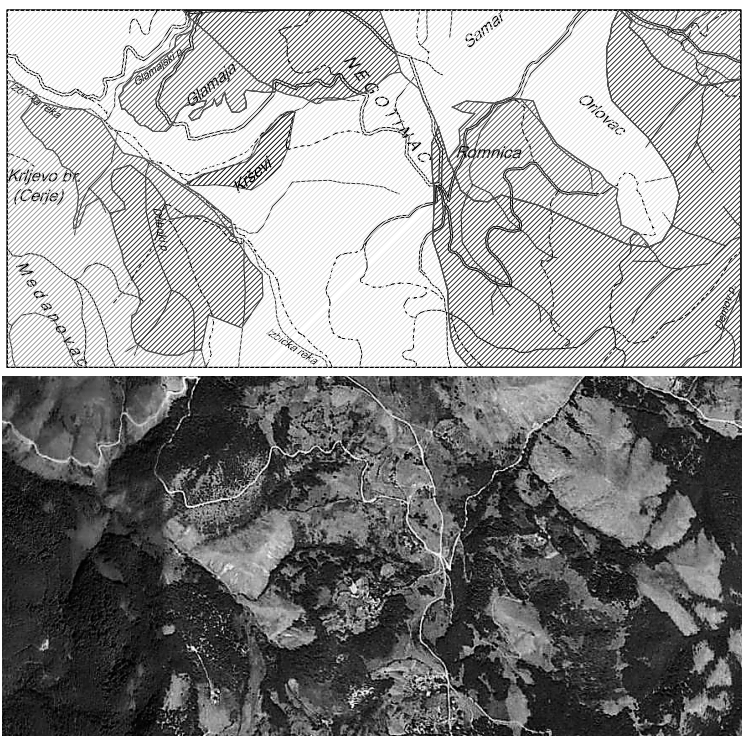
f coefficient - is the numerical equivalent to the visible and clearly expressed erosion processes in watershed (area);

J mean – mean slope of drainage basin, i.e. of erosion area.

The calculation of coefficient of erosion by the methods of Professor S. Gavrilović (Z) and Professor B.V. Poljakov (a) is presented in the Table 2.



Picture 2- Erosion map



Picture 3- Detail from satellite survey used for map erosion producing

Table 2- Coefficient of erosion for the area Medenovac-Karavansalija

| Ordinal number | The name of the watershed | Y | X × a | f | J _{sr} | Z | a |
|----------------|---------------------------|------|-------|------|-----------------|------|------|
| 1 | Kašaljska river | 0,95 | 0,35 | 0,37 | 0,183 | 0,27 | 1,40 |
| 2 | Barska river | 0,95 | 0,33 | 0,42 | 0,109 | 0,24 | 1,20 |
| 3 | Crnačka river | 0,90 | 0,30 | 0,46 | 0,247 | 0,26 | 1,38 |
| 4 | Vučjalokvarska river | 0,85 | 0,42 | 0,50 | 0,150 | 0,32 | 1,70 |
| 5 | Inter-watershed number 5 | 0,80 | 0,40 | 0,40 | 0,272 | 0,29 | 1,50 |
| 6 | Inter-watershed number 6 | 0,80 | 0,42 | 0,42 | 0,261 | 0,31 | 1,52 |
| 7 | Izbička river | 0,82 | 0,48 | 0,50 | 0,135 | 0,34 | 1,78 |
| 8 | Netvrčki brook | 0,85 | 0,34 | 0,41 | 0,153 | 0,23 | 1,19 |
| 9 | Inter-watershed number 10 | 0,85 | 0,41 | 0,46 | 0,226 | 0,32 | 1,70 |
| 10 | Zlatna river | 0,85 | 0,35 | 0,41 | 0,147 | 0,24 | 1,20 |
| 11 | Rajetička river | 0,90 | 0,36 | 0,43 | 0,168 | 0,27 | 1,40 |

The calculated mean value of coefficient of erosion for the observed watersheds and subwatersheds ranges between Z=0.23 (Netvrčki potok) and Z=0.34 (Izbička river). Since the mean coefficient of erosion for the area Medenovac-Karavansalija in Rogozna is Z=0.282, this area can be classified into the Category IV of the destructiveness. According to the type of the erosion surface and combined erosions are dominant, whereas deep erosion is present sporadically.

The mean annual erosion sediment yield (total bedload and suspended sediment) was calculated by the form of Professor S. Gavrilović.

$$W_{\text{year}} = T \times H_{\text{year}} \times \pi \times \sqrt{Z^3} \times F \quad \text{m}^3 \text{ year}^{-1}$$

Where:

W_{year} – total yield (erosion sediments production for the observed hydrological unit in $\text{m}^3 \text{ year}^{-1}$);

T – temperature coefficient of the area (watershed);

$$T = \sqrt{\frac{t^0}{10}} + 0,1;$$

t^0 – mean annual air temperature of the area (watershed) expressed in degrees Celsius;

π – Ludolf's number

F – area of the drainage basin in km^2 ;

Z – coefficient of erosion according to Professor S. Gavrilović

The calculation of the mean annual erosion sediment yield for the separated hydrological units is presented in Table 3.

The total sediment yield in the area Medenovac-Karavansaliya is $W_{\text{year}}=17172,32 \text{ m}^3 \text{ year}^{-1}$, and mean specific sediment yield is $W_{\text{spec}}=291.99 \text{ m}^3 \text{ year}^{-1} \text{ km}^{-2}$.

The highest specific sediment yield is in the watershed of Izbička river $W_{\text{spec}}=384.99 \text{ m}^3 \text{ year}^{-1} \text{ km}^{-2}$, and the lowest specific sediment yield is in the watershed of Netvrčki brook $W_{\text{spec}}=214.20 \text{ m}^3 \text{ year}^{-1} \text{ km}^{-2}$.

Table 3- Mean annual erosion sediment yield

| Num. | The name of the watershed | t (°C) | T | Hgod (mm) | π | Z | F km^2 | Wgod $\text{m}^3 \text{ god}^{-1}$ | Wgod $\text{km}^{-2} \text{ m}^3 \text{ god}^{-1} \text{ km}^{-2}$ |
|------|---------------------------|--------|------|-----------|-------|------|-----------------|------------------------------------|--|
| 1 | Kašaljska river | 9,2 | 1.01 | 612,33 | 3,14 | 0,27 | 7,84 | 2135,98 | 272,45 |
| 2 | Barska river | 9,2 | 1.01 | 612,33 | 3,14 | 0,24 | 5,45 | 1244,37 | 228,32 |
| 3 | Crnačka river | 9,2 | 1.01 | 612,33 | 3,14 | 0,26 | 3,39 | 827,76 | 257,45 |
| 4 | Vučjalokvarska river | 9,2 | 1.01 | 612,33 | 3,14 | 0,32 | 10,66 | 3747,30 | 351,53 |
| 5 | Inter-watershed number 5 | 9,2 | 1.01 | 612,33 | 3,14 | 0,29 | 2,99 | 906,79 | 303,27 |
| 6 | Inter-watershed number 6 | 9,2 | 1.01 | 612,33 | 3,14 | 0,31 | 0,45 | 150,83 | 335,18 |
| 7 | Izbička river | 9,2 | 1.01 | 612,33 | 3,14 | 0,34 | 7,61 | 2929,81 | 384,99 |
| 8 | Netvrčki brook | 9,2 | 1.01 | 612,33 | 3,14 | 0,23 | 5,28 | 1130,99 | 214,20 |
| 9 | Inter-watershed num. 10 | 9,2 | 1.01 | 612,33 | 3,14 | 0,32 | 3,84 | 1349,87 | 351,53 |
| 10 | Zlatna river | 9,2 | 1.01 | 612,33 | 3,14 | 0,24 | 7,48 | 1707,87 | 228,32 |
| 11 | Rajetička river | 9,2 | 1.01 | 612,33 | 3,14 | 0,27 | 3,82 | 1040,75 | 272,45 |

The bedload and suspended sediment discharge was calculated by the form of Profesor B.V. Poljakov:

$$V = \rho \frac{M_0 F}{10^3 \gamma_1} \times 31.5 \times 10^6 (1 + \beta / \gamma_2) \quad (\text{m}^3 \text{year}^{-1})$$

Where:

V – total volume of bedload and suspended sediment in $\text{m}^3 \text{year}^{-1}$

ρ – mean annual water muddiness in gr m^{-3}

$$\rho = \alpha \times a \times b \times c \times d \times e \times f \times \sqrt{i} \times 10^8 \quad (\text{gr m}^{-3})$$

Where:

a coefficient of erosion according to Poljakov determined by the transformation of coefficient of erosion Z according to Profesor Gavrilović

i flattened slope

a coefficient which refers to the vegetation condition in the watershed

b coefficient which refers to the watershed arrangement

c coefficient which refers to digging areas

d coefficient of the slope form in watershed

e coefficient of the river network density

f coefficient which refers to the mechanical soil composition

M_0 Module of the mean annual water runoff from the watershed in $\text{l s}^{-1} \text{km}^{-2}$

F area of the watershed in km^2

γ_1 bulk density of the suspended sediment in KN m^{-3}

γ_2 bulk density of the bedload in KN m^{-3}

β ratio of bedload and suspended sediment weight obtained by the use of the tables

The calculation of the bedload and suspended sediment for the separated hydrological units is presented in Table 4.

The calculated quantities of sediment discharge which is carried away from the area Medenovac-Karavansalija are $V=6796,19 \text{ m}^3 \text{ year}^{-1}$. Approximately 30% of the total quantity of the sediment discharge is carried away from the watershed. It was adopted that all the sediment yield from the inter-watershed is carried away out of the border of the investigated area. The greatest percentage of the bedload which reaches the border of the area is 23%, and is present in Crnačka river. The mean value of the bedload for the separated watersheds is 21.0%.

Note: The sediment yield was not calculated separately for the subwatersheds. It was adopted that all the calculated quantities of yield reached the border of the observed area from the subwatersheds.

4 CONCLUSION

The calculated mean value of coefficient of erosion for the observed watersheds and subwatersheds ranges between $Z=0.23$ (Netvrčki brook) and $Z=0.34$ (Izbička river). Since the mean coefficient of erosion for the area Medenovac-Karavansalija in Rogozna

Table 4- Calculation of the bedload and suspended sediment discharge

| N | The name of the watershed | α | a | b | c | d | e | f | Iur | ρ | M_0 l s ⁻¹ km ⁻² | F km ² | Y_1 KN m ⁻³ | Y_2 KN m ⁻³ | β | V m ³ god ⁻¹ | V ^{sus} m ³ god ⁻¹ | V ^{bed} m ³ god ⁻¹ |
|----|---------------------------|----------|------|------|------|------|------|------|-------|--------|--|----------------------|-----------------------------|-----------------------------|---------|---------------------------------------|--|--|
| 1 | Kašaljska river | 1,4 | 0,65 | 0,70 | 0,70 | 0,75 | 0,65 | 0,65 | 0,060 | 346 | 6,0 | 7,84 | 10 | 17 | 0,46 | 651,11 | 512,69 | 138,42 |
| 2 | Barska river | 1,2 | 0,65 | 0,75 | 0,75 | 0,75 | 0,65 | 0,65 | 0,045 | 272 | 6,0 | 5,45 | 10 | 17 | 0,44 | 352,69 | 280,17 | 72,52 |
| 3 | Crnačka river | 1,38 | 0,65 | 0,70 | 0,70 | 0,75 | 0,65 | 0,65 | 0,090 | 418 | 6,0 | 3,39 | 10 | 17 | 0,52 | 248,16 | 267,81 | 80,35 |
| 4 | Vučjalokvarska river | 1,7 | 0,70 | 0,70 | 0,70 | 0,70 | 0,65 | 0,70 | 0,038 | 362 | 6,0 | 10,66 | 10 | 17 | 0,42 | 909,52 | 729,34 | 180,18 |
| 5 | Inter-watershed number 5 | 1,5 | | | | | | | | | | 2,99 | | | | 906,79 | | |
| 6 | Inter-watershed number 6 | 1,5 | | | | | | | | | | 0,45 | | | | 150,83 | | |
| 7 | Izbicka river | 1,7 | 0,70 | 0,70 | 0,70 | 0,70 | 0,65 | 0,70 | 0,075 | 508 | 6,0 | 7,61 | 10 | 17 | 0,49 | 941,08 | 730,65 | 210,43 |
| 8 | Netvrčki brook | 1,19 | 0,65 | 0,70 | 0,70 | 0,65 | 0,65 | 0,65 | 0,075 | 285 | 6,0 | 5,28 | 10 | 17 | 0,49 | 366,32 | 284,40 | 81,92 |
| 9 | Inter-watershed number 10 | 1,7 | | | | | | | | | | 3,84 | | | | 1349,89 | | |
| 10 | Zlatna river | 1,2 | 0,70 | 0,70 | 0,70 | 0,70 | 0,65 | 0,65 | 0,053 | 280 | 6,0 | 7,48 | 10 | 17 | 0,45 | 500,73 | 395,84 | 104,89 |
| 11 | Rajetička river | 1,4 | 0,70 | 0,70 | 0,70 | 0,70 | 0,65 | 0,65 | 0,060 | 348 | 6,0 | 3,82 | 10 | 17 | 0,46 | 319,09 | 251,25 | 67,84 |

is $Z=0.282$, this area can be classified into the Category IV of the destructiveness. According to the type of the erosion surface and combined erosions are dominant, whereas deep erosion is present sporadically.

The total sediment yield in the area Medenovac-Karavansalija is $W_{\text{year}}=17172,32 \text{ m}^3\text{year}^{-1}$, and mean specific sediment yield is $W_{\text{spec}}=291.99 \text{ m}^3\text{year}^{-1}\text{km}^{-2}$.

The quantities of the sediment discharge which refer to the area Medenovac-Karavansalija is $V=6796,19 \text{ m}^3\text{god}^{-1}$, and the specific quantity of sediment, i.e. quantity of the sediment per 1 km^2 of area is $V_{\text{spec}}=115.56 \text{ m}^3\text{km}^{-2}\text{year}^{-1}$.

According to the calculated coefficient of erosion Z , sediment yield and discharge, the most frequent category of erosion in the investigated area Medenovac-Karavansalija is weak erosion, which is in the accord with the way in which the soil is used (the territory is mainly covered by forest and grass areas).

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EROSION PROCESS IN LOCALITY MEDENOVAC-KARAVANSALIJA IN ROGOZNA

Mihailo Ratknić, Svetlana Bilibajkić, Sonja Braunović

Summary

The phenomenon of soil erosion is one of the oldest problems of the human civilization. The problems of erosion and soil loss can be traced back to the beginning of agriculture. In recent times, the problem of soil erosion has occurred more frequently, due to the increase in population and agricultural pressure.

This paper deals with the definition of the condition of the erosion process in the area Medenovac-Karavansalija in Rogozna and calculation of the mean annual erosion sediment yield and discharge. The investigated area covers an area of 58.81 km^2 . The methodology applied in this paper is based on the cartographic, teledetection and empirical methods.

By the data obtained by the detailed terrain recognition, analysis of the satellite photos, data on the geological and pedological base, climate factors, as well as data on the vegetation arrangement, the coefficient of erosion (Z) for the area Medenovac-Karavansalija was determined analytically, by the separated hydrological units (watersheds and inter-watersheds) by the methodology of Professor S.Gavrilović.

Since the mean coefficient of erosion for the area Medenovac-Karavansalija in Rogozna is $Z=0.282$, this area can be classified into the Category IV of the destructiveness. According to the type of the erosion surface and combined erosions are dominant, whereas deep erosion is present sporadically.

The mean annual erosion sediment yield (total bedload and suspended sediment) was calculated by the form of Professor S. Gavrilović.

The total sediment yield in the area Medenovac-Karavansalija is $W_{\text{year}}=17172,32 \text{ m}^3\text{year}^{-1}$, and mean specific sediment yield is $W_{\text{spec}}=291.99 \text{ m}^3\text{year}^{-1}\text{km}^{-2}$.

The bedload and suspended sediment discharge was calculated by the form of Profesor B.V. Poljakov:

The quantities of the sediment discharge which refer to the area Medenovac-Karavansalija is $V=6796,19 \text{ m}^3\text{god}^{-1}$, and the specific quantity of sediment, i.e. quantity of the sediment per 1 km^2 of area is $V_{\text{spec}}=115.56 \text{ m}^3\text{km}^{-2}\text{year}^{-1}$.

According to the calculated coefficient of erosion Z , sediment yield and discharge, the most frequent category of erosion in the investigated area Medenovac-Karavansalija is weak erosion, which is in the accord with the way in which the soil is used (the territory is mainly covered by forest and grass areas).

EROZIONI PROCESI NA LOKACIJI MEDENOVAC – KARAVANSALIJA NA ROGOZNI

Mihailo Ratknić, Svetlana Bilibajkić, Sonja Braunović

Rezi me

Fenomen erozije zemljišta spada u najstarije probleme ljudske civilizacije. Sa povećima poljoprivrede javljaju se problemi erozije i gubitka zemljišta. U novije vreme, sa porastom stanovništva i agrarnog pritiska, problem erozije zemljišta je sve prisutniji.

U ovom radu definisano je stanje erozionih procesa na području Medenovac – Karavansalija na Rogozni i obračunata je srednje godišnja produkcija i pronos erozionog nanosa. Istraživano područje zahvata površinu od 58.81 km^2 .

Primenjena metodologija u ovom radu zasniva se na katrografskim, teledetekcionim i empirijskim metodama.

Na bazi podataka dobijenih detaljnim rekognosciranjem terena, analizom satelitskih snimaka, podataka o geološkoj i pedološkoj podlozi, klimatskim činiocima, kao i podataka o rasporedu vegetacije, analitički je određen koeficijent erozije (Z) za područje Medenovac – Karavansalija i to po izdvojenim hidrološkim jedinicama (slivovima i međuslivovima) metodologijom prof. S. Gavrilovića.

Srednja vrednost koeficijenta erozije za područje Medenovac – Karavansalija na Rogozni iznosi $Z=0,282$ pa se područje može svrstati u IV kategoriju razornosti. Po tipu erozije prevladavaju površinska i mešovita erozija, dok je dubinska prisutna sporadično. Proračun srednje godišnje produkcije erozionih nanosa (ukupni vučeni i suspendovani nanos) izvršen je po obrascu prof. S.Gavrilovića.

Ukupna produkcija nanosa na području Medenovac-Karavansalija iznosi $W_{\text{god}}=17172,32 \text{ m}^3\text{god}^{-1}$, a srednja specifična produkcija nanosa je $W_{\text{spec}}=291,99 \text{ m}^3\text{god}^{-1}\text{km}^{-2}$.

Proračun pronosa vučenog i suspendovanog nanosa izvršen je prema obrascu prof. B.V Poljakova:

Količine pronosa nanosa koje se odnose sa područja Medanovac-Karavansalija iznose $V=6796,19 \text{ m}^3\text{god}^{-1}$, a specifična količina nanosa tj. količina nanosa koja se odnosi sa 1 km^2 područja iznosi $V_{\text{spec}}=115,56 \text{ m}^3\text{km}^{-2}\text{god}^{-1}$.

Na osnovu sračunatih vrednosti koeficijenta erozije Z , produkcije i pronosa nanosa na istraživanom području Medanovac – Karavansalija najzastupljenija kategorija erozije je slaba erozija, što je u skladu je sa načinom korišćenja zemljišta (na području su pretežno zastupljene šumske i travne površine).

Reviewer: Milorad Veselinović, Ph.D, Institue of Forestry, Belgrade

