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Article Review

Determining the relationship type between different components of soil erosion using rain simulator in Gachsaran Formation

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A B S T R A C T

Determining the type of relationship between different components of soil erosion can provide more complete information about the performance of these components in different watersheds and land uses. In this study, in order to determine the type of relationship between different components of soil erosion in different land uses of Gachsaran Formation deposits, a part of Kuhe Gach watershed with an area of 1202 hectares was selected. In this study, using univariate regression, the type of relationships between sediment - runoff, sediment - infiltration, sediment - runoff and erosion threshold, runoff - infiltration, runoff - runoff and erosion threshold, infiltration - runoff and erosion threshold were determined and also, the relationship between them was also examined. Sampling of erosion different components at 6 points with 3 replicates and at different rainfall intensities of 0.75, 1 and 1.25 mm/min in three land uses of the range, residential area and agricultural lands using a rain simulator was performed. SPSS and EXCEL software were used for statistical analysis. The results showed that in general in the intensity of 0.75 mm/min in all three land uses, range, agricultural and residential and in the relationship between all the different components of soil erosion in seven cases, there is a positive relationship and in eleven cases, there is a negative relationship. And at an intensity of 1 mm/min in all three rang, agricultural and residential land uses and in the relationship between all the different components of soil erosion in seven cases, there is a positive relationship and in eleven cases, there is a negative relationship. And at an intensity of 1.25 mm/min in all three uses of the range, agricultural and residential land uses and in the relationship between all the different components of soil erosion in eight cases, there is a positive relationship and in ten cases, a negative relationship.

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Extended Abstract

Introduction

Determining the type of relationship between different components of soil erosion can provide more complete information about the performance of these components in different watersheds and land uses .Soil erosion is known as earth cancer due to its intensifying properties and apparent or hidden environmental and social multilateral effects. Preventing soil erosion is vital and necessary to preserve valuable natural wealth. Investigation of runoff and sediment production is one of the main and important processes of soil erosion and loss that it seems necessary to be aware of the characteristics affecting it. Runoff and sediment production due to water erosion depends on factors such as soil texture, building and soil infiltration and rainfall characteristics. Erosion component is an element or component of erosion processes that without having them cannot be analyzed erosion process. By measuring the various components of soil erosion and the relationship between them, in addition to proper analysis of the erosion process, an appropriate understanding of this process and proper evaluation of it can be found. This research provides useful and valuable work to better understand soil erosion processes in the desired watershed and also to provide deeper research in various other basins.

Methodology

In this study, in order to determine the type of relationship between different components of soil erosion in different land uses of Gachsaran Formation deposits, a part of Kuhe Gach watershed with an area of 1202 hectares was selected. In this study, using univariate regression, the type of relationships between sediment - runoff, sediment - infiltration, sediment - runoff and erosion threshold, runoff - infiltration, runoff - runoff and erosion threshold, infiltration - runoff and erosion threshold were determined and also, the relationship between them was also examined. Sampling of erosion different components at 6 points with 3 replicates and at different rainfall intensities of 0.75, 1 and 1.25 mm/min in three land uses of the range, residential area and agricultural lands using a rain simulator was performed. SPSS and EXCEL software were used for statistical analysis. This rain simulator is suitable for determining the soil erosion characteristics, runoff, water infiltration and soil researches and its use is a standard method for determining the runoff of surface deposits in the field. A total of 18 sediment samples, 18 runoff samples, 18 soil infiltration samples and 18 runoff and erosion threshold samples were performed. SPSS and EXCEL software were used to perform all statistical analyses and then the final models were determined using univariate regression.

Results and discussion

The results showed that in general in the intensity of 0.75 mm/min in all three land uses, range, agricultural and residential and in the relationship between all the different components of soil erosion in seven cases, there is a positive relationship and in eleven cases, there is a negative relationship. And at an intensity of 1 mm/min in all three rang, agricultural and residential land uses and in the relationship between all the different components of soil erosion in seven cases, there is a positive relationship and in eleven cases, there is a negative relationship. And at an intensity of 1.25 mm/min in all three uses of the range, agricultural and residential land uses and in the relationship between all the different components of soil erosion in eight cases, there is a positive relationship and in ten cases, a negative relationship.

Conclusion

The results of this study showed that erosion different components in Gachsaran Formation have very complex relationships and certainly each watershed has unique relationships in erosion different components.Therefore, with proper knowledge and understanding of the relationships between erosion different components in watersheds, can be reached a basic solution to reduce erosion in different basins. One of the most important reasons for failure in erosion is the lack of

understanding of erosion different processes and the relationships that be created between them, which will ultimately lead to poor executive tasks that without being a treatment for erosion in watersheds will only increase the executive costs.

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Conflicts of interest
The authors declared no conflict of interest.

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