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Simulative modeling of the soil erosion processes

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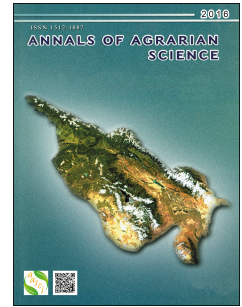
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ABSTRACT

In order to visualize the negative consequences of soil erosion processes running in Georgia, namely in the Gldaniskhevi ravine within the territory of Tbilisi, research field integrated polygon has been arranged on the eroded slope chosen beforehand.

At the control area of polygon 24 field experiments have been carried out to study the dynamics of the formed erosion processes under the different intensity precipitation conditions, whereby scour parameters were being measured (average depth – h, average width – b, B).

For estimating the exactness of calculations done on the results of measurements accomplished with the purpose to definite the intensity of soil erosion processes, the method of least squares have been used, on the base of which contour dependence between investigated parameters and therefore validity of the accomplished researches have been ascertained.

Simulative modeling of the soil erosion processes has been accomplished by means of special computer programs, which has shown, that during 167 days at the control area of the field polygon the eroded slope gulleying processes have been significantly strengthened, that nowadays can be also noticed on the slopes outside the polygon, on account of which can be concluded, that in order, to prevent expected landslide and debris flow phenomena in the river Gldaniskhevi ravine, implementation of urgent effective anti-erosive measures is needed.

Keywords: Erosion, Landslide, Debris flow, Vulnerable, Geomat, Simulative modeling.

Introduction

Lately, intensive precipitates formatted on a background of the changes in climate of the earth, provoke developing of floods of catastrophic character, soil erosion processes, debris flow and landslide phenomena.

Defending of population from natural disasters, safe functioning of engineering-industrial objects became the priority for the most of the countries in the world in the beginning of the XXI century. The highly developed countries of the world make attempts to elaborate their own system of struggling against the natural calamities. Common strategical trend on investigation and forecasting of natural abnormal phenomena has been elaborated.

In Georgia soil erosion processes are widely spread, namely, ravines, field ditches and other erosion forms constitute 20-25% of agricultural zone territory.

The problem of alteration in landscapes and their degradation, according to the changes in climate and expected consequences, threatens the large territory of the country.

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