ORIGINAL PROJECTS AND RESEARCHES

RIVER HYDRO CONSTRUCTION AND GEOMORPHOLOGICAL PROCESSES OF THE BLACK SEA COAST OF GEORGIA
(Monograph)

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Annotation

The Monographs considers the dangerous geomorphological changes in the Black Sea regions of Geor-gia, caused by the hydro-engineering constructions in the catch basins of the rivers Enguri, Rioni and Chorokhi.

Causes of failure of river protection measures have been researched.
Environmental and marine-hydro engineering projects implemented by different firms in Georgia are critically evaluated

Analytical and numerical methods of hydraulic calculation of riverbeds in the coastal areas and marine-hydraulic hydropower structures have been developed, the use of which ensures the stability of the coastline and the reliable exploitation of the existing hydraulic structures in river estuaries.

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HYDROTECHNICAL CONSTRUCTION IN THE CHOROKHI RIVER BASIN AND GEOMORPHOLOGICAL PROCESSES IN THE BLACK SEA REGION OF ADJARA

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Abstract:

The purpose of this work is to review geomorphological processes triggered as a result of hydrotechnical (dam) construction on the Chorokhi River and its tributaries that pose a great threat to the Adjara region, and in particular, the Adlia-Batumi segment as its coastline might be washed away. In the work it is studied and analyzed the factors of bank formation. The view has been expressed that a solution to the existing problem must be basically sought in pumping ashore by artificially spreading inert material.

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"Debris-flow Phenomena – Risk, Prediction, Protection"
(Monograph)

Prof. I. Kruashvili, Prof. E. Kukhalashvili, Prof. I. Inashvili, Ass. Prof. K. Bziava

Resume

Given monograph is dedicated to the theoretical decision of debrisflow engineering problems using mathematical models. The modern conditions studying the debris-flow processes has been analyzed and generalized. On the basis of theoretical researches the following significant and complete novelty has been obtained:

- taking into consideration the non-stationarity of debris-flow processes, the characteristics of debris-flow forming centers has been developed. Particularly, the regularity of modification of flow, movement velocity and height of centre in time has been determined, taking into consideration of rheological characteristics of cohesive debris-flow;
- expected flow of debris-flow forming centers has been theoretically estimated; the general calculation dependence of flows has been developed;
- based on the of maximum equilibrium equation, the calculation dependences of debris-flow channels, morphometric characteristics and stability factors has been determined; the base of deformation possibility of debris-flow channels has been estimated;

- calculation dependences for determination of design parameters of cross-section constructions has been developed taking into consideration the available reserves of cross-section of debris-flow channels;
- possibility of deformation resistance of self-forming channels that are continued on the cones of debris-flow and non-washed out model has been estimated;
- on the basis of differential equation of variable mass movement, the movement conditions of debris-flow on the cones has been studied. The calculation dependences of movement length, duration, resistance ratio and slope of movement resistance has been theoretically developed;
- on the basis of study of the cohesive debris-flow movement conditions and decision of second degree differential equation, the forecasting dependence describing the regularity of termination of final flow movement has been developed.

Regarding to the carried out fundamental studies, the received results will became the basis for design standards for regulation and protection measures of debris-flow processes and optimum decision of engineering problems.

The received results may be used for determination of cohesive debris-flow characteristics' modification regarding the time, for protection of different types of objects and land recourses that are located on the cones. Also, developed recommendations will provide significant assistance to the engineers during design the debris-flow control structures.

The results of specific objectives renders considerable assistance to design the debris-flow control structures in the field of hydraulic engineering land reclamation, hydraulics, physics of soil erosion, soil science and support scientists of the related fields.

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