

საქართველოს განათლებისა და მეცნიერების სამინისტრო
წყალთა მუშაობის ინსტიტუტი
ბარემოს დაცვის ეკოცენტრი



გივი გავარდაშვილი

ბუნებრივი და ტექნოგენური
კატასტროფებისას მთის ლანდშაფტების
უსაფრთხოების ღონისძიებები



თბილისი
2011

Givi Gavardashvili

Doctor of Technical Sciences, Professor

**MEASURES FOR THE SAFETY OF MOUNTAIN LANDSCAPES
DURING NATURAL AND TEHNOGENIC DISASTERS - 260 p.**

Tbilisi, 2011

551.311.21 : 627.141.1

**MINISTRY OF SCIENCE AND EDUCATION OF GEORGIA
INSTITUTE OF WATER MANAGEMENT
ECOCENTER FOR ENVIRONMENTAL PROTECTION**

**MEASURES FOR THE SAFETY OF MOUNTAIN LANDSCAPES DURING
NATURAL AND TECHNOGENIC DISASTERS**

Givi Gavardashvili

Doctor of Technical Sciences, Professor

The paper considers the estimation of ecological and economic damage to the forest tracts burnt as a result of the hostilities in August 2008 and measures for the protection of soil on mountain slopes.

The prediction of erosion and mudflow processes in the Aragvi catchment basin and their assessment as exemplified by the rivers Dushetis-khevi and Mletis-khevi is presented on the basis of an analysis of the field-expeditional studies carried out in 2005-2010. Engineering and phytoameliorative measures against erosion and mudflow processes in Lentekhi and Tsageri districts are presented.

Using the theory of reliability and risk, the reliability and the risk of breakdown of spring-board type new constructions are assessed in the case of separate and simultaneous action on the structure by the dynamic impact force of mudflow and the weight load caused by the mudflow mass.

Complex measures have been worked out and implemented for the rehabilitation of the eroded mountain slope adjoining v. Jvarboseli (Mtatusheti)

Taking into account risks of various provisions, a mathematical imitation of high waters in the case of possible breakdown of Georgia's high dams has been worked out using the cases of Zhinvali, Sioni, Lajanuri, Enguri and Shaori dams.

Using mathematical theory of catastrophe, the variability of potential energy of avalanche, which is in boundary equilibrium has been determined. It has been established that the exits from boundary equilibrium of the avalanche accumulated on mountain slope is described by the catastrophe of the fold. This makes possible to determine the peculiarity of the onset of avalanche motion with account of algebraic coordinates.

The work echoes the Hyogo framework document of the International Strategy of Disaster Reduction (ISDR) 2005-2015.

The work has been assessed and recommended for publication by the Scientific Council of the Institute of Water Management (Protocol № 21, 19 November 2010).

Editor: **Teimuraz Gvelesiani**
Doctor of Technical Sciences, Professor

Reviewer: **Giorgi Khelidze**
Doctor of Technical Sciences, Professor