

## CRUCIAL MOMENT OF TOPOGRAPHIC MAP FOR EFFECTIVE MANAGEMENT OF NATURAL DISASTERS

\*\*\*Gorgijandze S., \*\*\*\*Gorgodze T., \*\*\*\*Jincharadze G., \*Kobakhidze N.,  
\*\*\*Gulashvili Z., \*\*\*\*Silagadze M., \*\*\*Dvalashvili G.

\**Institute of Hydrometeorology at the Georgian Technical University*

\*\**Ministry of Defence of Georgia*

\*\*\**Institute of Geography, Tbilisi State University, Institute of Geography*

\*\*\*\**MA of political science, University of Salamanca, Spain.*

*sophiogorgijanidze@gmail.com*

**Abstract.** Georgia, as a country with many mountainous regions, is characterized by natural disasters. This means that our country always experiences one or another catastrophic processes locally. Against the background of climatic warming, the increase of water level in rivers and the melting of glaciers, accompanied by water falls and mudslides, became more active. These events took place both in the past and now in Georgia. Therefore, we need to know how to manage them, both from state structures, as well as through scientific research and state defense systems. It is important to note the role of topographic maps in managing such natural events. Its example is the Buba glacier and the Devdorak glacier, where a military contingent was involved in the final management and emergency rescue operations were carried out. This is doubly important during the current research in order to timely eliminate the negative consequences of the current disaster.

**Key words:** Landfill floods, breakthrough, glacier, mudflow

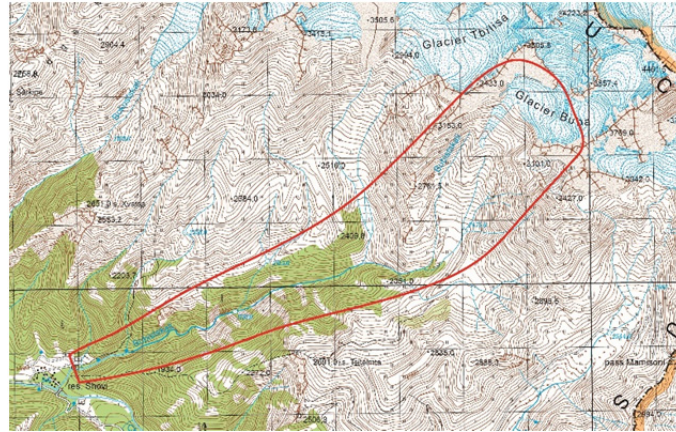
### Introduction

Georgia, as a country with many mountainous regions, is characterized by natural disasters. In fact, except for volcanism, all events are recorded by us. This means that our country always experiences one or another catastrophic processes locally. Earthquakes, landslides, glacial actions, avalanches and floods are noteworthy. Against the background of climate warming, melting of glaciers has become more active, accompanied by flood and Mudflow. Also, one of the types of natural events is the catastrophic floods formed during the eruption of the flooded lakes caused by the encroachment of the river valleys. As a result, the entire perimeter of the river valley is flooded with water. During these years, they had many places in Georgia. Casualties and losses caused by them are also frequent. A classic example of this is August 2023, Racha, Shovi resort. When the glacial water mass on the Buba River completely covered its valley. Unfortunately, 33 people lost their lives in this disaster. This information is given in the work of S. Gorgijanidze: „The Geography of Risks of Breakthrough of Glacial Lakes and Valleys“ [1,2]

On the basis of the field studies carried out in the valley, it was established that west of Buba glacier, there was a collapse of the rock mass, which collided with the glacier, caused the collapse of a certain part of it, which may have caused the activation of the water beaten up under the glacier and the water fall. In itself, this was preceded by the melting of the glaciers, which is taking place in all those areas where there is an intensity of global climatic warming. The raging flood covered the territory of the Shovi resort. destroyed the houses and infrastructure there. It became necessary to search and evacuate the tourists and the population living there. The State Rescue Service and the local population were actively involved in the search and rescue service. These works covered several stages. First, the study of the area through topographical maps, on which the search and rescue work was to be carried out. The second phase was the investigation and extent of the natural phenomenon in the Shove resort, and the third phase was the final search with the involvement of several services [3,4,5].

## Results

It should be noted that for the first time the distribution of the area was investigated by means of a topographical map of 1: 50,000 places. The glacier was explored. from which it was found that the glacier has shrunk. Then again, by means of a topographical map, on which all the objects and places are marked in detail, the area of the mudflow spread itself was studied (Fig. 1).



**Fig. 1. River Buba basin, Buba glacier, the research and exploration area is bounded by a red line (map author T. Gorgodze)**

Here it is necessary to mention that the ongoing works were so difficult and large-scale that the State Rescue Service was assisted in the search and rescue process by the military units of the Ministry of Defense. The soldiers, again based on topographical mapping and their modern equipment, continued the initial actions that helped the region to resolve the disaster mitigation measures. Unfortunately, the search for people was going on for almost a month and a half. Finally, the bodies of 33 people were found. On the first day, more than 200 people were evacuated with proper actions and cartographic planning (Fig. 2).



**Fig. 2. Georgia, Racha, Shovi in 2022 and 2023 before and after the disaster (2022 photo G. Jincharadze, 2023 photo National Environment Agency).**

Maps are very important during and after a disaster. This is just one example when soldiers were deployed in strategic areas of the country, mapping the area and eliminating negative consequences. The same thing happened in 2017 during the Devdorak glacier tragedy. After that, the state installed an early warning system in that area, which will prevent the impending disaster.

For this, it is necessary to process various topographical and schematic maps. As well as the processing of aerial photo material, the definition of clear modeling for the mitigation of natural events in their active zones [6].

At the first stage, it is important to study the terrain map of this or that region, then the synoptic map, which should be accompanied by multi-year data according to climatic conditions. A hydrographic and topographic map of population settlement is necessary. Here we should mention the familiarization of various geo-information maps, which give us the answer to which natural event is widespread where [7].

## Conclusions

All this will help us to manage the natural event both before and after it. Therefore, using different maps over the years and refining them is a necessary condition in mitigating any event. As for the involvement of the military units of the Ministry of Defense using their topographic map, it is very important for our country, because they help the population and rescue teams in all places and situations, which makes their defense activities very valuable.

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