

RISK DISASTER MANAGEMENT OF THE DURUJI RIVER THROUGH INNOVATIVE MEASURES

POLICY PAPER SUMMARY



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Eastern Partnership Civil Society Forum Georgian National Platform is an association of local and international non-commercial legal entities registered in Georgia, aiming to promote and implement the goals set by the Joint Declarations of the Prague, Warsaw and Vilnius Eastern Partnership Summits and the EU-Georgia Association Agreement of European Neighborhood Policy and other joint events.

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Summary

The following report is a research to explore prevention of the Kvareli flooding through risk disaster management by retention of debris flow in the catchment basin of the Duruji River and utilization of clay shale sediment as innovative building materials.

This report's goal is to assess the prevention and mitigation of the Kvareli flooding risk associated with frequent debris flows in the bed of Duruji River.

The proposed solutions are to retain the debris flow, which originates in the mountains, using innovative technologies in the catchment basin of Duruji River and utilize the sediment load as building materials.

The expected results of these measures are a reduced flooding risk in Kvareli as a result of the frequent debris flows in the catchment basin of Duruji River. Moreover, a reduced environmental impact through the production of new energy efficient building materials, newly created jobs, a supported economy and sustainable development.

Clay shale is the rock is the main cause of environmental disasters in Georgia

The global out of balance ecosystem has led to serious climatic change and has resulted in the need to manage and prevent possible natural disasters, ensuring the protection and safety of society. In Georgia, the Duruji River gorge problem is a part of this global problem. The solutions proposed in this policy paper could be of interest to countries facing a similar situation after conducting appropriate adaptive studies.

In the Caucasus Mountain regions, as a result of global warming, erosion and decomposition processes have accelerated. In the Duruji river gorge this had led to an accumulation of debris as a result of flow fractions, created due to melted snow/rainfall constantly moving the debris downward. The annual volume of sediment of ecogenically renewable weathered rocks reaches up to 0.5 mln m³. Currently, more than 15 mln m³ sediment is accumulated disrupting the natural equilibrium of the region and creating an environmental concern - risk of flooding and burying Kvareli as the sediment and accumulated mass level have elevated to a height of 10 meters above the residential area of Kvareli.

Pre-project researches have shown that ecogenically renewable sediment accumulated near Kvareli is compiled of venomous/asp-like clay shale. This shale could be used to produce the following products using ecologically effective technologies, after additional studies are conducted:

- additive-modifier for increasing strength/sulfate stability of cement/concrete;
- energy efficient lightweight building insulation materials (including expanded clay).

Due to the volatile economic situation in Georgia (in 2015 the GDP amounted to 14.0 billion US dollars, which is the lowest rate in the region), the rich mineral resources, including clay shale accumulated near Kvareli, should be maximally utilized. It is essential to ensure accurate, optimal and timely use of available natural resources using science-based technologies, approaches and solutions.

Therefore, it is recommended to clean the bed of the Duruji River off the 20 mln m³ sediment accumulated near Kvareli and turn the sediment load into a product reducing the risk of flooding and burying Kvareli. Meanwhile, the following building materials, worth about 1.5 billion US dollars, could be produced: small energy efficient lightweight insulation tiles and blocks, expanded clay, mineral supplement - modifier for cement.

With the support of governmental and donor organizations, and investments attracted through a fundraising campaign (proposed working title of this campaign: «Kvareli's environmental concern-risk,») could be turned into a new source of building material production, business and economic development, and will, as a result, create jobs.

Scientifically proven effective activities allow transformation of the construction field into a key sector supporting Georgia's economy and sustainable development using ecologically effective technologies and cheap raw materials, the ecogenically renewable clay shale.

It is noteworthy that, according to the latest data, clay shale and the building materials produced with it, have antiradiation properties, an important factor to consider as the overall radiation increase is a concern. Moreover, it will ensure export of the derived products to locations where recovery measures are being taken - and presumably will last for a long period of time - in response to nuclear power plant accidents (e.g. Chernobyl, Fukushima).

The first proposed recommendation includes the following activities:

- implement flood prevention measures in the Duruji River basin;
- draft an ecologically effective protection project and implement a business plan for its implementation;
- conduct an environmental impact assessment.

The second proposed recommendation includes the following activities:

- produce lightweight building insulation materials;
- draft an enterprise project and develop a business plan for construction;
- conduct an environmental impact assessment.

The third proposed recommendation includes the following activities:

- develop the technology for production of burnt clay shale - mineral additive adapted in Georgia to produce Portland cement Pucolan, standardized by European standards EN 197-1 (CEM II/AQ and CEM II/BQ);
- draft an enterprise project and develop a business plan for construction;
- conduct an environmental impact assessment.

The fourth proposed recommendation includes the following activities:

- draft an enterprise project for lightweight building insulation material - expanded clay ("Haydite" or "Expanded clay shale");
- develop a business plan for construction;
- conduct an environmental impact assessment.

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