

Recommendation for Disaster Risk Reduction of Batumi Coast- Adlia Section

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Economic development of Georgia directly associated with the ecological state of the coast and processes contributing to its sustainability and possible operation. Human impact on the coastal processes together with current natural ones has caused increased erosion along the coast and the beaches scour, that increased the risks of destruction to various types of complexes located in this zone.

The analysis of carried out coast protection measures has shown, that they were not enough correct for shore stabilization, uneffective and in major cases causing negative results- provokes beach erosion. Therefore, it became necessary to devise new approaches that take into account the reduction of coast protection structures impact on natural environment and minimizing the financial costs of their operation.

The goal of the research is the development of a rational and effective method of coast protection by Geo-tubes, taking into account the hydrodynamic and sediment drift processes of the coast. In particular for sector -Adlia (Batumi coastline) adjoined to strategic destination object- airport runway.

The assessment of Adjara coast evolution' natural and technogenic processes, impacting on shore and coast protection structures current state, was made. The methodic of laboratory research was developed.

The effectiveness of an extended-submerged breakwater has been tested in TSU Fluid Mechanics and Oceanography Laboratory wave tank. The carried out research complex has shown the advantage of breakwater, located before the wave breaking line in comparison with the same one, located at wave breaking line.

The analysis of results shows that for case of relative depth h/b increment from 0 to 4-5, efficiency of one-sided breakwater quickly reaches 70%; further increase in depth does not influence the efficiency. Under the same conditions, the use of two-sided breakwater decreases down drift alongshore transport approximately by factor of 1,5-3,0 times in comparison with one-sided one. Therefore it is more preferable for coast protection.

On Adlia shore submerged slope, the building of the above mentioned breakwater is recommended with a height of 6-8 m., width of 10-15 m. of the crest and side edges slope 1:2. It should be mentioned that presence in coastal water of submerged breakwater impairs water exchange, as a result, measures directed at water quality improvement behind the construction should be provided. That is why submerged breakwater of an extended profile proposed, has to be built with deepened crest 2 m. below the NSL-of 50% probability.

With the reason to avoid possible bed erosion behind and in front of the breakwater, we recommend creation of one-two layer artificial reef, by sorted porous stones of 0,5-1,0 m. diameter and their occupation with sea filtration organism like double swing mussels are. To carry out such measure is necessary, because while construction of a new beach and during the first years of its operation temporary reductions of biomass, buried by structures, might occur. However, after 2-3 years the phyto and zoo/bentos will be completely restored and the conditions of bio-efficiency of Adlia coastal water-increased.

In our opinion to protect Adlia shore, using the offered technology, preferably the creation of breakwater in combination with crossbars. For the geotubes filling and beach artificial nourishment the sandy-pebble sediments, accumulated in Vartsikhe and Gumati reservoirs, or in North branch of Rioni rivermouth, or in Chorokhi canyon, can be used.