

Monitoring Temporal Movement of Samanalawewa Dam Using GNSS Observations

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The results of monitoring temporal movements are related to safety of engineering structures and human and animal lives. All engineering structures are subject to deform and displace due to several factors such as environmental stress, structural overload, tectonic movements etc. Generally, temporal movements monitoring can be accomplished by geodetic and geotechnical methods. Geotechnical instrumentation can achieve very good one-dimensional or two-dimensional results but often limited to the area where the instruments installed. Conventional geodetic method using terrestrial instruments for example total stations, EDM etc. is comparatively a slow process to GNSS method. Besides, GNSS can offer three-dimensional results at a relatively lower budget.

The Samanalawewa Dam is a dam that is primarily used for hydroelectric power generation in Sri Lanka. With heavy land mass movements the area surrounded by Samanalawewa, in the form of rock falls, landslides it will be useful to conduct a monitoring on the Dam itself in order to see is current standing. This research will highlight the role of GNSS application in geodetic deformation monitoring of the Dam for its planimetric movements using GNSS control network established in the vicinity at stable ground platforms. Also the research expand with to see for the best control network establishment (Using GNSS) in the case of large structural movements such as Dams, Bridges, etc., to use Differential GNSS observations to measure the points on the Dam from first and second order control networks to see for movements and to See the stability (any persistent change in the position) of the Dam with the fluctuation of the water volume.

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