

Annual Variation of Bilibili Dam Innudation Area Revealed By SAR Observation

*Teguh Purnama Sidiq*¹, Agustan², Edwin Alexander³, Ilham Alimuddin⁴*

¹ Faculty of Earth Sciences and Technology, Institut Teknologi Bandung (ITB), Indonesia

² National Research and Innovation Agency (BRIN), Indonesia

³ Ministry of Public Works and Housing, Indonesia

⁴ Department of Engineering Geology, Universitas Hasanuddin, Indonesia

Bili-bili dam is one of the most important and the largest dam in South Sulawesi Province, Indonesia, built in 1997 to provide water for agriculture, power plant, raw water reservoir, and also tourism. It cover more than 400.000 m² area with effective volume of about 346 million m³. Most of the water are came from Jenebarang River, which supply the water on average of 3.8 m³/second. During its operatrion, there are many challenges need to overcome in order to make the dam in full capacity all the time, for example the sedimentation caused by large area of land cover change in the intake river upstream, activity of sand mining, etc. In this study, we monitor the dam innudation area from 2017 to 2023 using Sentinel-1 GRD dataset. We used normalized intensity radar image from dual-polarization of Sentinel-1 data to identify water body. Moreover, we select specific threshold and use Moore-Neighborhood Algorithm to binary classificate the water body and non-water body, and then calculate the area in map projection. Our result show the annual variation of innudation area in Bili-bili dam, with value of about 30%. However, water level data from Balai Besar Wilayah Sungai of Jenebarang under The Ministry of Public Work and Housing of Indonesia, shows no significant water level difference, thus our result may indicate the shallowing of the dam floor. Further work still need to be done for revealing the cause of large annual innudation variation.

Keywords: innudation area, SAR intensity, dam, sentinel-1