**Abstract**

Climate change have resulted in the receding of glaciers and induced the Glacier lake outburst floods (GLOFs) Disaster throughout the world including Pakistan. GLOF are amongst the most common climate-change hazards in northern Pakistan. Globally the frequency and magnitude of GLOF has been increased due to recent climatic variability Glacier lakes are common phenomena in the HKH region Glacier lake outburst floods have repeatedly caused the death tolls and severe damage to downstream infrastructures. In the present study, GLOF mapping and modelling was carried out using remote sensing and geographical information system techniques. Observed data of lake area, volume, and depth having similar lake characteristics reported in this study are used to develop empirical equations by using statistical methods. Change detection techniques such as the normalized difference water index, Land Use Land Cover were applied on Sentinel imagery for the identification of the temporal behavior of Eastern Hindu Kush glacial lakes. Analysis revealed that 101 glacial lakes in 2000,124 glacial lakes in 2010 and 162 glacial lakes that were identified in 2020, according to glacial lake assessment no of lakes and surface area of lakes increased in 2000 the surface area was 9.72 $km^2$ in 2010 the total surface area of lake 11.08 $km^2$ and in 2020 the surface area or lake 12.36 $km^2$. There are 31 PGLs that have been identified 6 Chitral-GL, 16 Swat-GL and 9 Upper Dir-GL. Only 2 lakes as high potential glacial lakes (Chitral-GL2 and Swat-G 31). The depth of the lake was estimated to be 41 m and 30.43 m. The total 15 Lakes in the Eastern Hindu Kush are disappear and 79 new lakes formed during the period of 2000-2020. Two Highly Potential lakes lie in the heavy rainfall area. Due to climate change and global warming melting of ice, Rainfall and Temperature are the major cause of GLOF. The resultant of GLOF modeling total 20.56 $km^2$ area submerge by glacial lake according to two flood scenario. The result and finding of this study can be assist Provincial Disaster Management Authority (PDMA), National Disaster Management Authority (NDMA), Soil Department and Irrigation Department to design GLOF risk reduction strategies.