Monitoring Spatio-temporal change of water body using Google Earth Engine: A case study of Tsho Rolpa lake, Nepal.

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SUMMARY

Glaciers is the large dense ice, in a form of rock, that moves downhill with its own weight. Glaciers melting and outburst of glacier lake is very common in the Himalayan country, proper monitoring and understanding the development of glacial lake is necessary to minimize the risk of glacier moving downhill. Remote Sensing is one the techniques to study the dynamics of the glacier and the lake formed by the glaciers. Multi temporal satellite image is important to study various phenomenon in this case. Landsat image having the oldest history in satellite remote sensing are used in monitoring using the imagery from various time. Monitoring using satellite image plays important role in accessing the real condition and accessing the requirement of resources for conservation and protection or maintaining perspective. Landsat Imagery in analyzing the spatio-temporal change is very important for water resources conservation. The encroachment, expansion or any kind of result can be found by using Landsat imagery. In this study Landsat imagery is used to study the spatio-temporal change of Tsho Rolpa Lake situated in the central Nepal. This lake has potential danger of outburst which may affect the environment underneath the lake.

NDWI and MNDWI was used in this study to extract boundary of Tsho rolpa lake using Google earth engine platform. Threshold value of 0.2 has been used to extract polygonal lake boundary. Geometric parameter was calculated using GIS software, the result obtained has shown the lake area has been expanding between 2010 to 2023 from 0.09 cubic kilometer to 0.098 cubic kilometer. This kind of study can be used for the lake monitoring so that proper actions can be taken by the concerned authority for mitigating the risk of the lake outburst.