



**Q. What is a Glacial Lake Inventory?**

It is a dataset outlining the details of individual glacial lake which can provide information on their spatial distribution. It also contains information on location, aerial extend, elevation, types of glacial lake and local names of all existing glacial lakes.

**Q. Why is it important to have a Glacial Lake inventory?**

Glacial lakes are common features in mountainous areas formed as a result of glacial activities. Once formed these glacial lakes grow in size in course of time, turn into huge moraine dammed lakes with a potential to outburst and cause catastrophic damages to the lives and properties of people living in the downstream area. Because of the impact of climate change, glaciers around the world have experienced accelerated melting resulting in an increasing number of glacial lakes over the past few decades. Apart from posing risk to communities and infrastructures in the downstream valleys, these lakes also serve as storage for fresh water and help in regulation of flows in the streams and rivers, which are vital for sustaining lives and maintaining ecosystems. Therefore, an updated inventory on glacial lakes in the country can serve as a primary source of information for any scientific studies as well as basis for various socio-economic developmental planning in the country



*Bathymetry Survey at Metatshota Lake II*

**Q. What was the need to update the Inventory of Glacial Lakes in Bhutan ?**

The inventory of glaciers and glacial lakes published by ICIMOD in 2001 is being used for all official referencing purposes so far for glacial lakes in Bhutan. Although there were few other inventories of glacial lakes in Bhutan published by individual researchers and institutes but those are either focused on regional coverage or specific research purpose. The only official country focused inventory on glacial lakes published by ICIMOD is about two decades old. Considering the dynamic nature of glaciers and glacial lakes under the influence of the impact of climate change, a need was felt to have an updated and country focused inventory of glacial lakes in Bhutan which can be used for all official referencing hereafter. The present inventory has been prepared to meet this objective using the most recent high quality base materials and techniques.



*Lunana Complex : left to right Baytsho , Rapstring lake and Thorthormi Lake*

### Q. What are the results from BGLI 2021?

The following are the results from Bhutan Glacial Lake Inventory 2021:

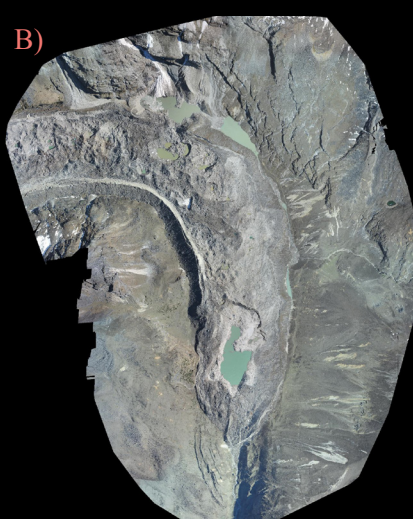
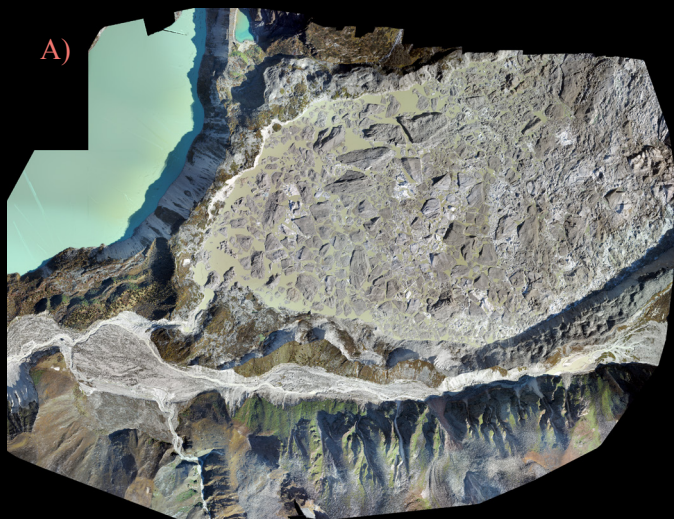
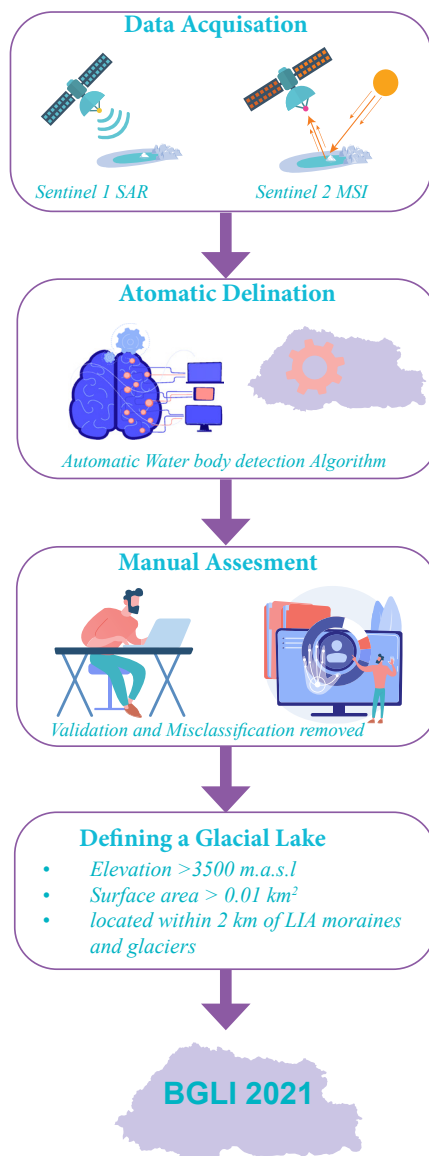
- A total of 2979 water bodies was mapped of which 567 are classified as glacial lakes after applying the criteria for lakes to be considered as glacial lakes.
- Glacial lakes cover an area of  $55.04 \pm 0.055 \text{ km}^2$  i.e. 0.14% of total Land cover area of Bhutan.
- Pho chhu sub basin has the highest number of glacial lakes (157) of which 9 are PDGL.
- The largest glacial lake is Thorthormi lake (G090269E28109N) which lies in the headwater of Pho chhu sub basin with a surface area of  $4.20 \text{ km}^2$ .
- Most glacial lakes are erosional type, followed by moraine dammed and least is Ice dammed lakes
- Glacial Lake elevation in Bhutan ranges from 4750 m.a.s.l. to 5200 m.a.s.l.

### Q. What are the benefits of Bhutan Glacial Lake Inventory 2021?

The information generated in the BGLI 2021 can be used in the following areas:

- Water resources assessment : contribution of water from glacial lake to the river systems.
- Climate indicators: Glacial lakes being dynamic in nature and considering the impacts of climate change on the glaciers in the eastern Himalayas which are experiencing accelerated retreat rate resulting in formation of new glacial lakes. Their status indicates the state of the prevailing climate conditions and the risk associated with its expansion to the downstream.
- For the development of hazard maps and monitoring of Potential Dangerous Glacial Lakes.
- Building a national database on cryosphere for future studies.
- Guideline for planners and decision makers in planning and coordination of various developmental activities in the country.

## Methodology



Contact us at



A) Thorthormi lake at Pho Chhu sub-basin. B) Karma lake at Paa chhu sub-basin; Captured by eBee Drone