



**2025**  
International  
Year of Glaciers'  
Preservation

**Launch of IYGP 2025 –  
SIDE EVENT #35**

**Decades of cryosphere actions in  
HKH: Moving towards a flagship  
initiative**

21 January 2025  
06:00 – 07:30 UTC, and 12:00 – 1:30 BTT  
Online | Thimphu, Bhutan

<https://www.un-glaciers.org/>





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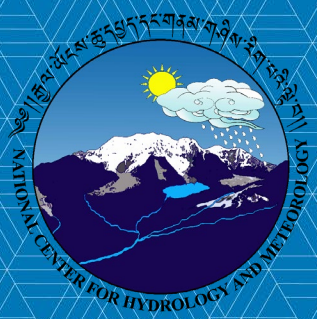


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# Status of Glaciers of Bhutan Himalaya

*As observed from Gangju La and Thana Glaciers*

**Phuntsho Tshering, NCHM, Bhutan**

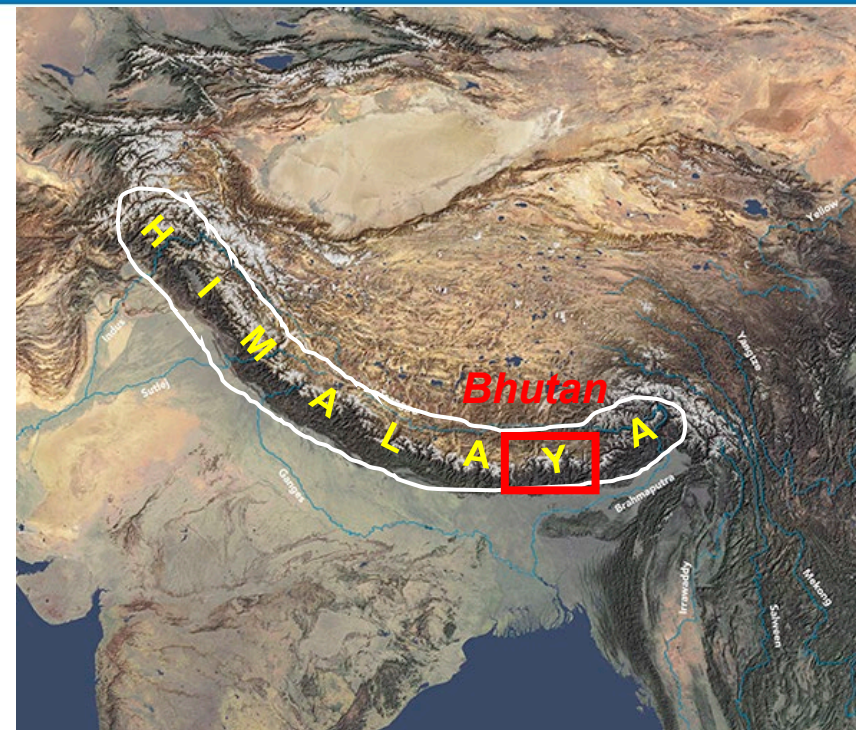


# Background

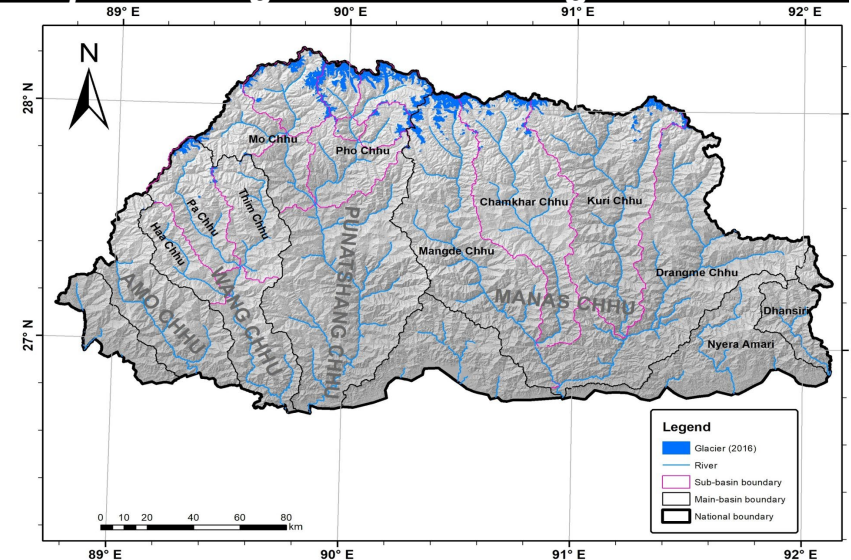
## Glaciers of Bhutan

- **Bhutan:** Part of the eastern Himalaya and home to a significant number of glaciers - 700 glaciers (BGI., 2018)
- **Area:** Covers 629.55 km<sup>2</sup>
- **Range:** 4000 – 7500 m a.s.l.
- **Role:** Critical source of freshwater, feeding into Bhutan's major river systems, terminate in glacial lakes (GLOF), economy
- **Tyes:** Valley and Mountain glaciers
- **Climate and retreat:** Highly sensitive to climate change being a summer accumulation type and changes in precipitation patterns

<https://www.un-glaciers.org/>



<http://more.glacierworks.org/the-rivers/>



# Study Area

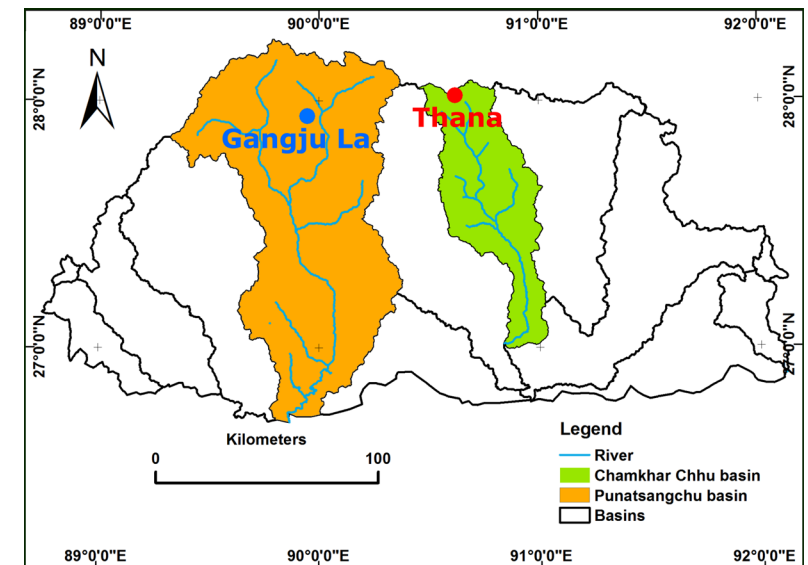
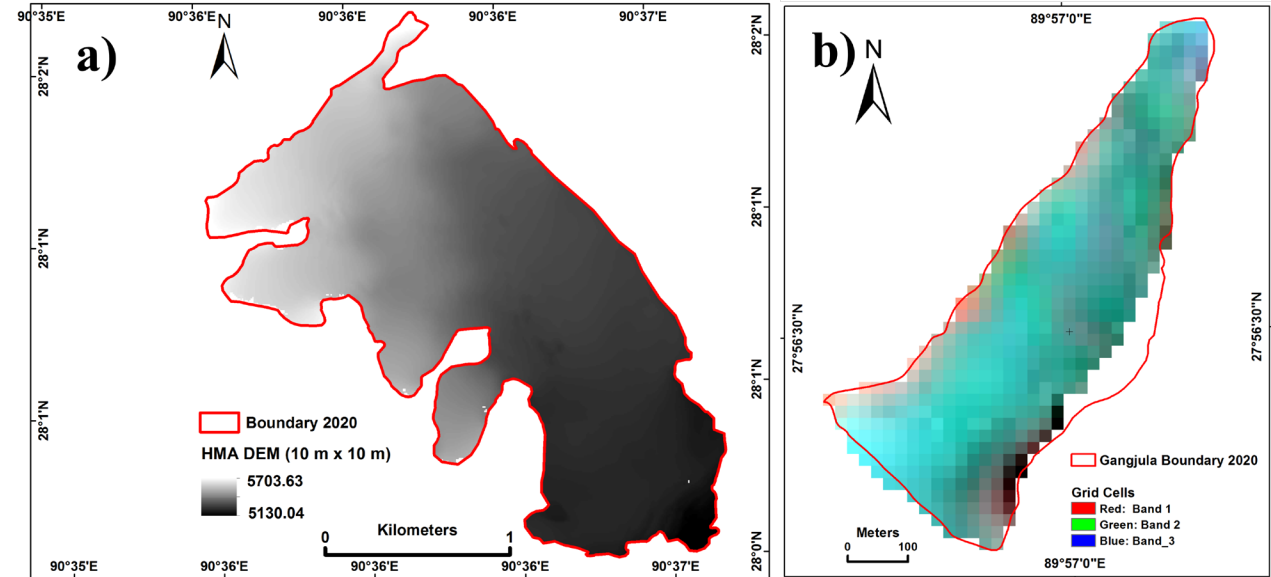
## Benchmark glaciers

### 1. Thana

- Glacier area: 3.5 km<sup>2</sup>
- Location: Headwater of Chamkhar Chhu

### • Gangju La

- Glacier area: 0.3 km<sup>2</sup>
- Location: Headwater of Pho Chhu

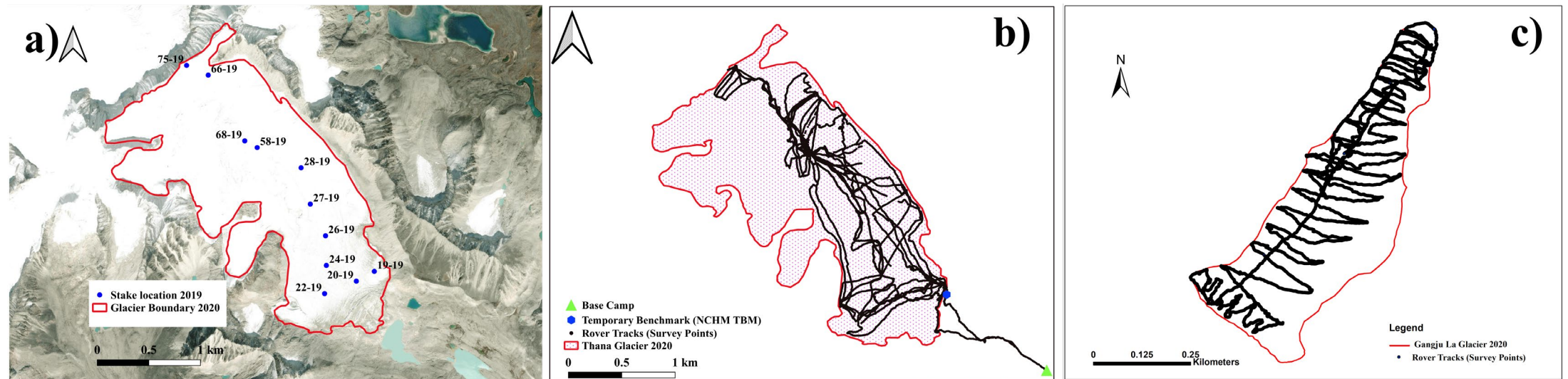




# Objectives

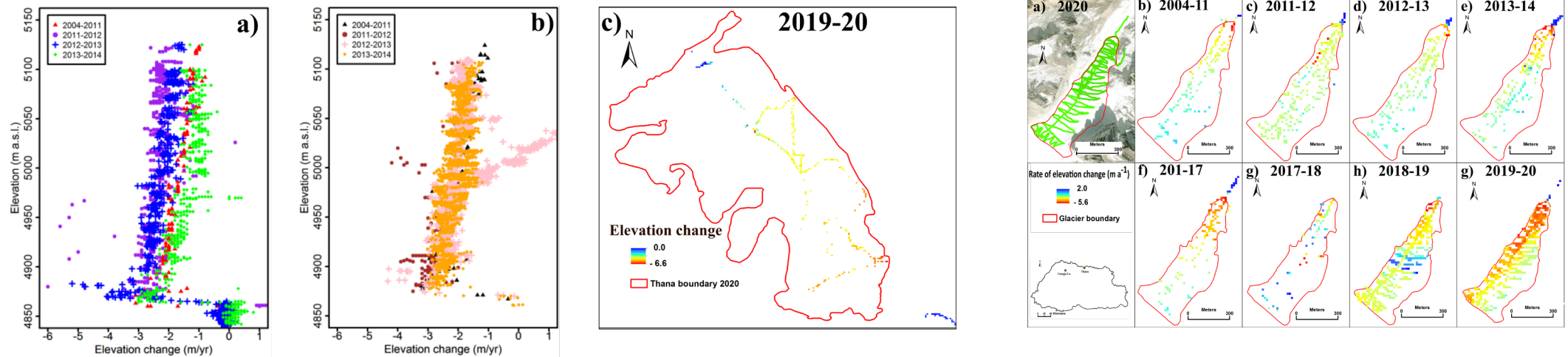
- Monitor mass balance of benchmark glaciers
- Assess climate change impacts
- Study terminus retreats

# Methodology



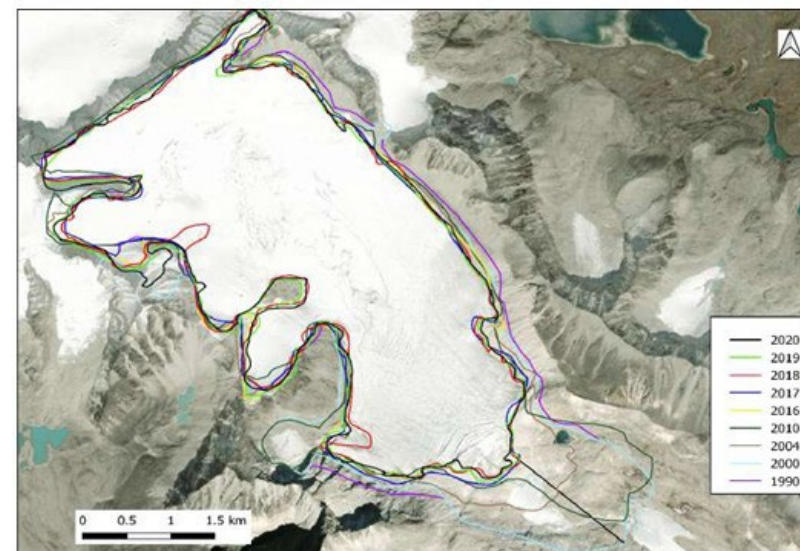
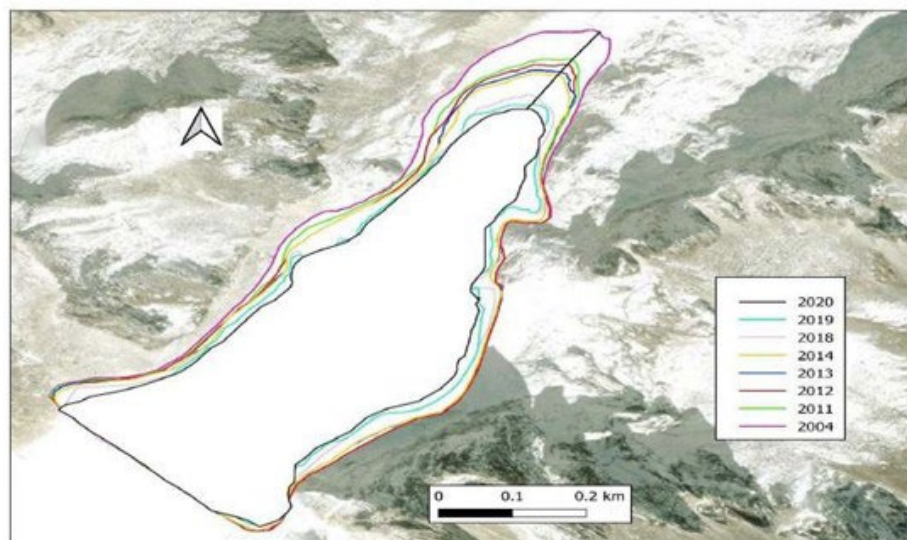
Deploy glaciological and in-situ based geodetic method (dGPS survey)

# Results (vertical thinning)



- The results are up to 2020
- Ever since the observation, both the glaciers show surface lowering (negative)

# Results (horizontal retreat)

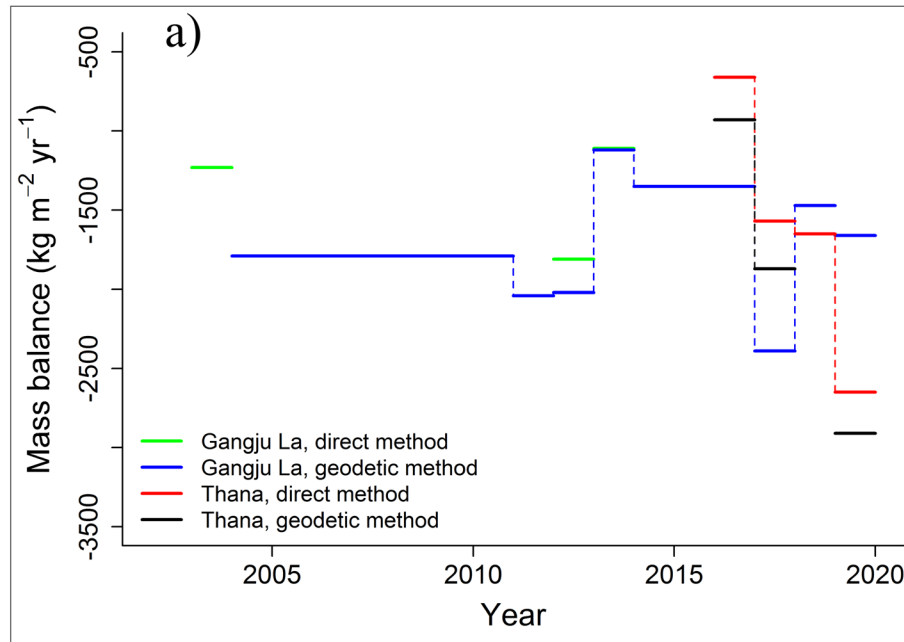


Horizontally

- The retreat rates have increased in the recent years (about 13 m/year)

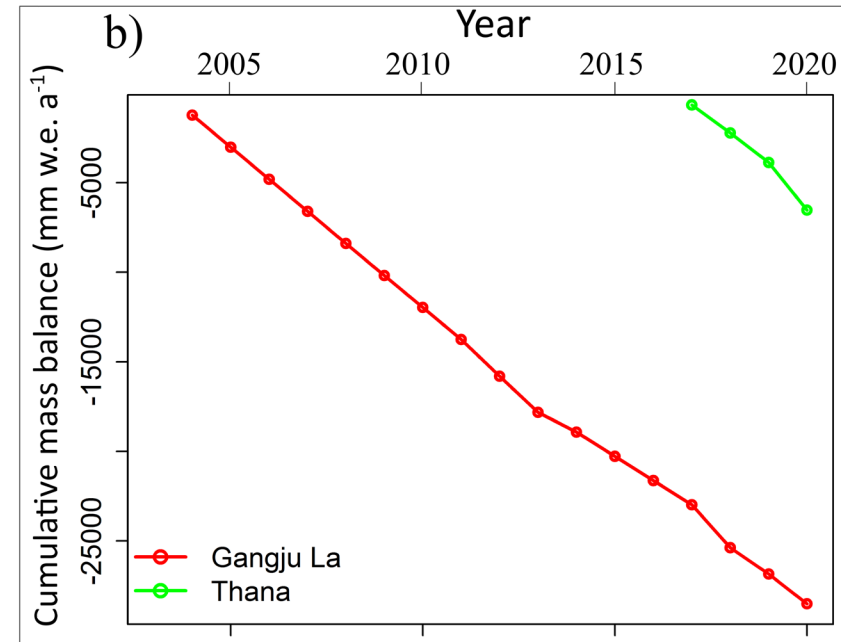


# Results



## Gangju La

- -1110 to -2390 mm w.e. annually
- Area reduced by 30%



## Thana

- -660 to -2910 mm w.e. annually
- Area reduced by 7%



# Discussions

- The glaciers show consistent mass loss
- Comparable to other Himalayan glaciers
- Highlights the urgency of climate action and monitoring



# Conclusion

- Glaciers in Bhutan are shrinking rapidly due to climate change
- Thana and Gangju La are marked as benchmark glaciers along with a new one (Shodug glacier)
- Gangju La might soon join the Global Glacier Casualty List
- Continued research and mitigation efforts are crucial



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# THANKS

