



AUTOMATED ICE RESERVOIRS

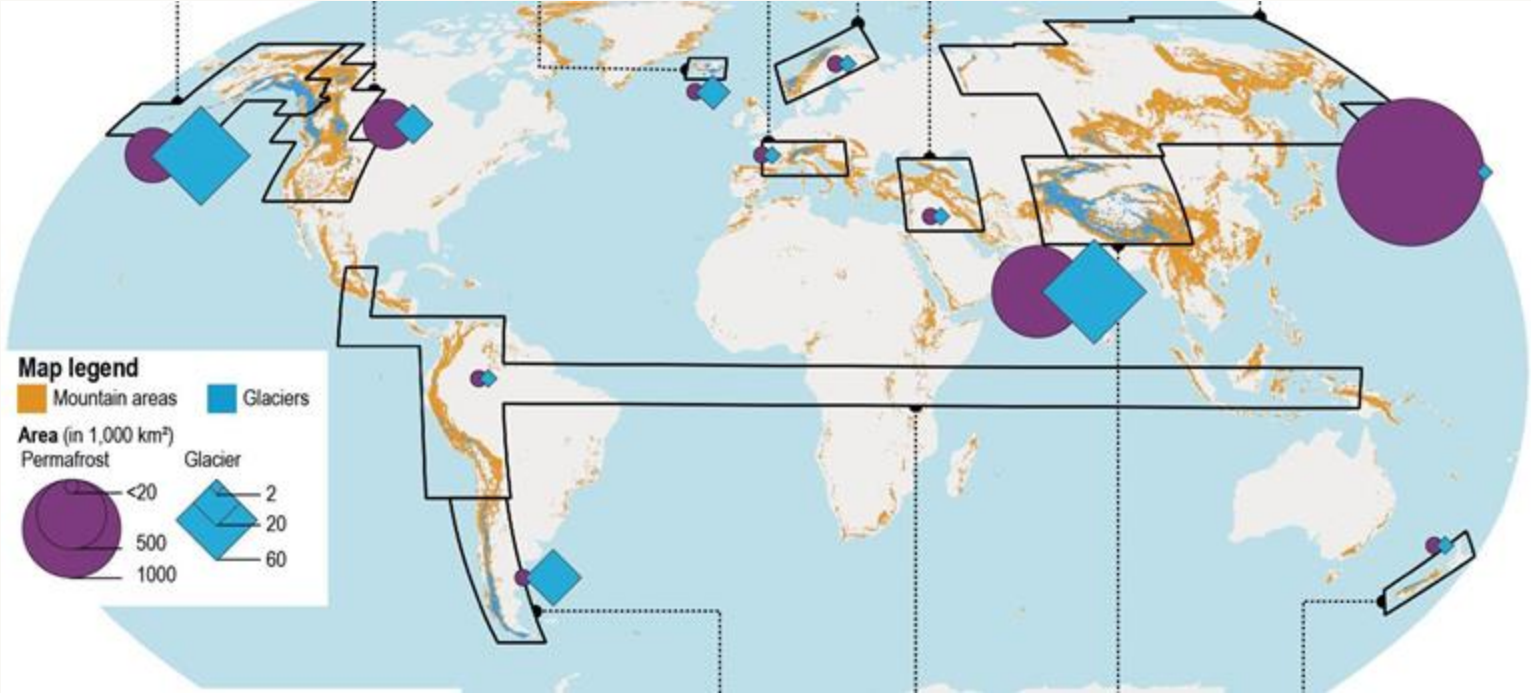
Dr. Suryanarayanan Balasubramanian

WE HELP DESERTIFYING MOUNTAIN REGIONS CONSERVE THEIR WATER RESOURCES

Acres of ice is a startup founded **3 years ago** with a **20+** team of engineers, mountaineers and scientists building tools like ice reservoirs and irrigation automation that help communities adapt against climate change induced water scarcity.



HALF THE WORLD'S GLACIERS WILL DISAPPEAR BY 2100



© David R. Rounce et al (2023), Global glacier change in the 21st century:

© IPCC Special Report on the Ocean and Cryosphere in a Changing Climate, 2019

THE LOCATION: LADAKH

High Altitude Desert

Receives less than 100 mm of rain annually

Source for the Indus Basin

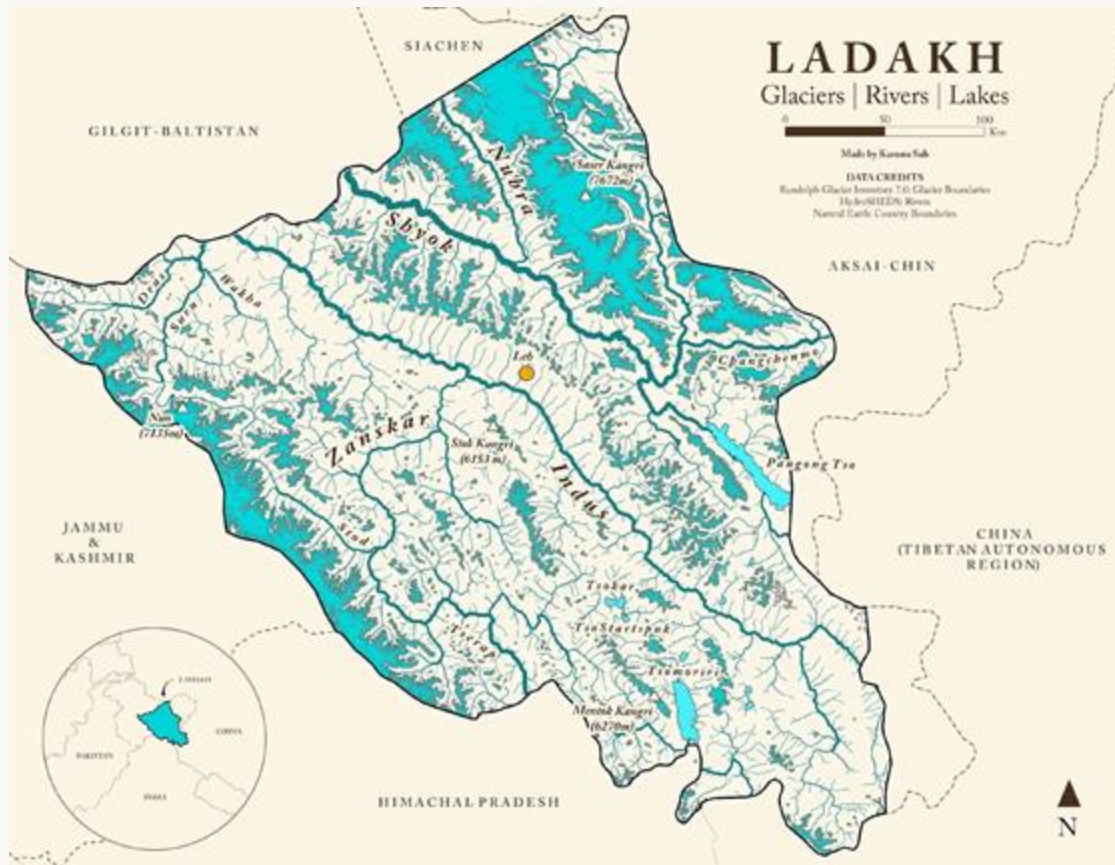
Ladakh is an important source of hydrological contribution to the Indus

Cryosphere Dependent

90% of villages rely on glacial supply for their water needs

Threat

An estimated 10% of villages may become abandoned by 2050 due to water stress



THE PROBLEM: WATER MISMATCH

One Crop Cycle

Ladakh gets one crop cycle making sowing imperative in March/ April for a harvest in September/October

Glacial Meltwater

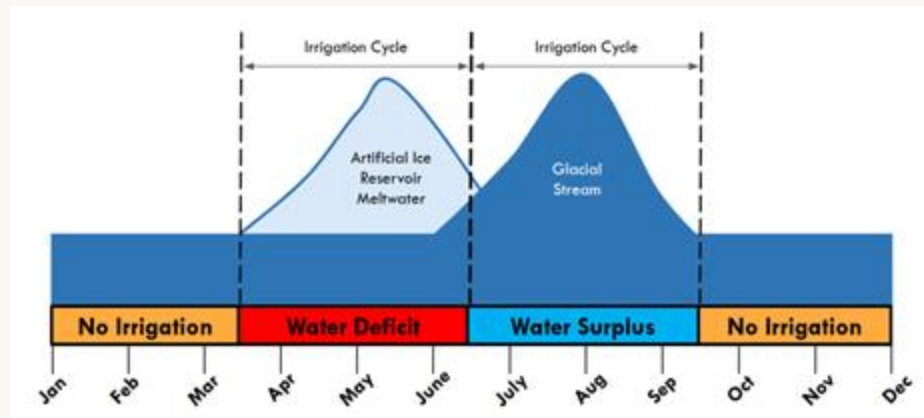
Glacial meltwater becomes available only by mid-June

Climate Change and Snowfall

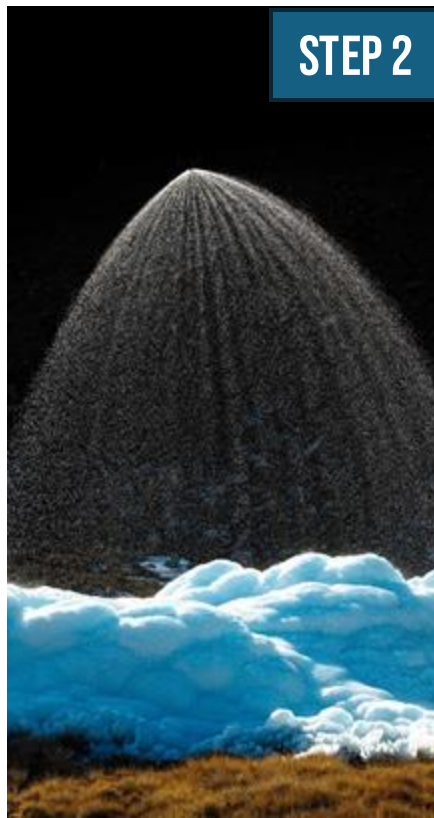
Water for the sowing season used to come from consistent winter precipitation and snowmelt, which is now an unpredictable resource

The Mismatch

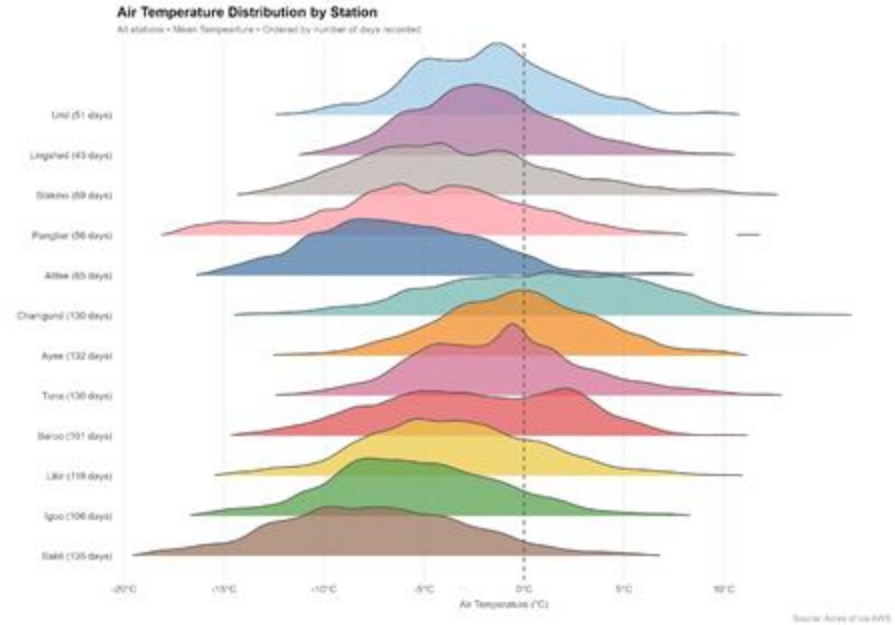
Not enough water when it's needed most.
Excess water when it's not needed.



THE ADAPTATION: ARTIFICIAL ICE RESERVOIRS



2025-26 CAMPAIGN SITES



Altitude Range: 2805 – 4470 m asl

Winter Temperature Range: -20°C to +10°C



ATITSE



LIKIR

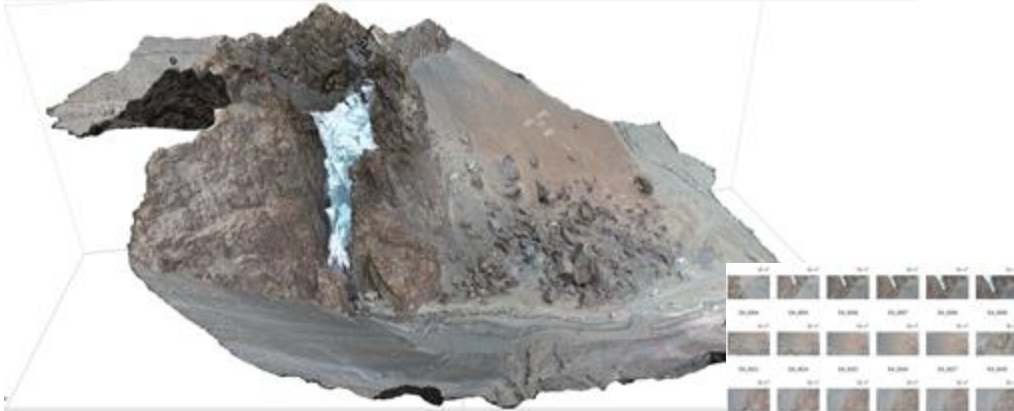


AYEE



BAROO

2025-26 CAMPAIGN SITES



Site	Max Ice Volume (million litres)
Igoo	1.61
Likir	2.86
Sakti	3.53
Ursi	3.34
Ayee	6.24
Tuna	0.96
Stakmo	N/A
Baroo	3.66
Chanigund	1.96
Pangbarbruk	1.17
Atitse	3.25
Lingshed	2.65
Total 2025-26	31.22 million litres

THE IMPACT: URSI (2025)

Pre-Intervention

Agriculture was on the verge of abandonment

Village youth-built ice stupas for 7 years requiring round-the-clock supervision and manual intervention through the winter

Post-Intervention

92% of households reported that the introduction of AIR improved agricultural water availability and led to increased crop yields.

Eliminating nighttime monitoring shifts reduced physical strain and freed time for other livelihood activities.



3700 m asl
Snow-fed
Catchment

16
households

4.5 mil liters of
ice

98% system
uptime

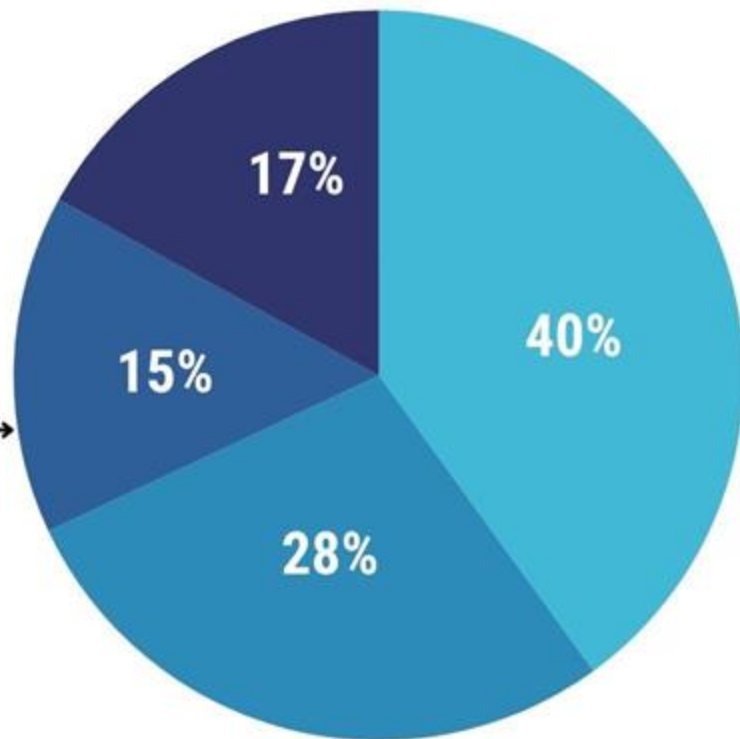
Economics

- Pipelines
- Automation kit
- Fountains
- Water management committee

0.003 USD

Water storage cost per litre

Cost of one ice reservoir
20,000 USD

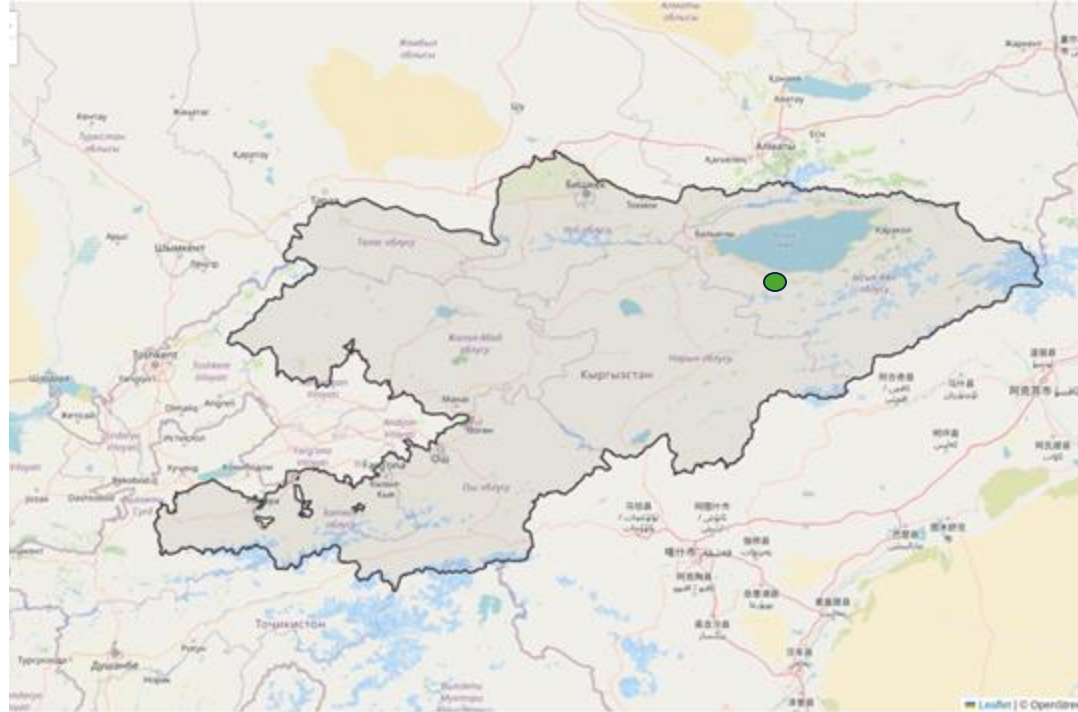


KYRGYZ ICE RESERVOIRS

20+ ice reservoirs already reported in Batken, Naryn and Ton regions since 2023

Two planned near Bokenbayevo
Ilbirs Foundation are the implementation partner and Acres of ice is the technical partner

Construction of first automated structures begins this June



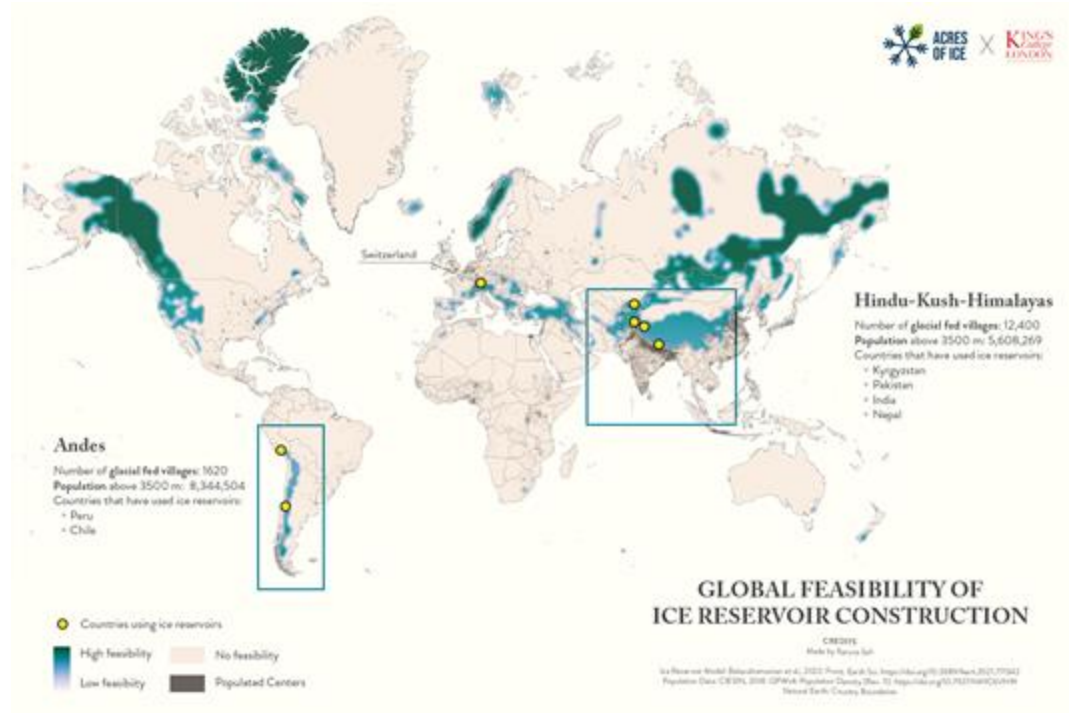
THE NEXT STEPS

Research Publication

Establishing a scientifically accepted methodology for volume estimation of ice reservoirs

Mitigation for Glacial Lake Outburst Floods

R&D of a siphoning and fountain system that can turn glacial lakes into ice reservoirs



THE ECOSYSTEM

Ecosystem Partners



Grant Partners




Research Collaboration





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