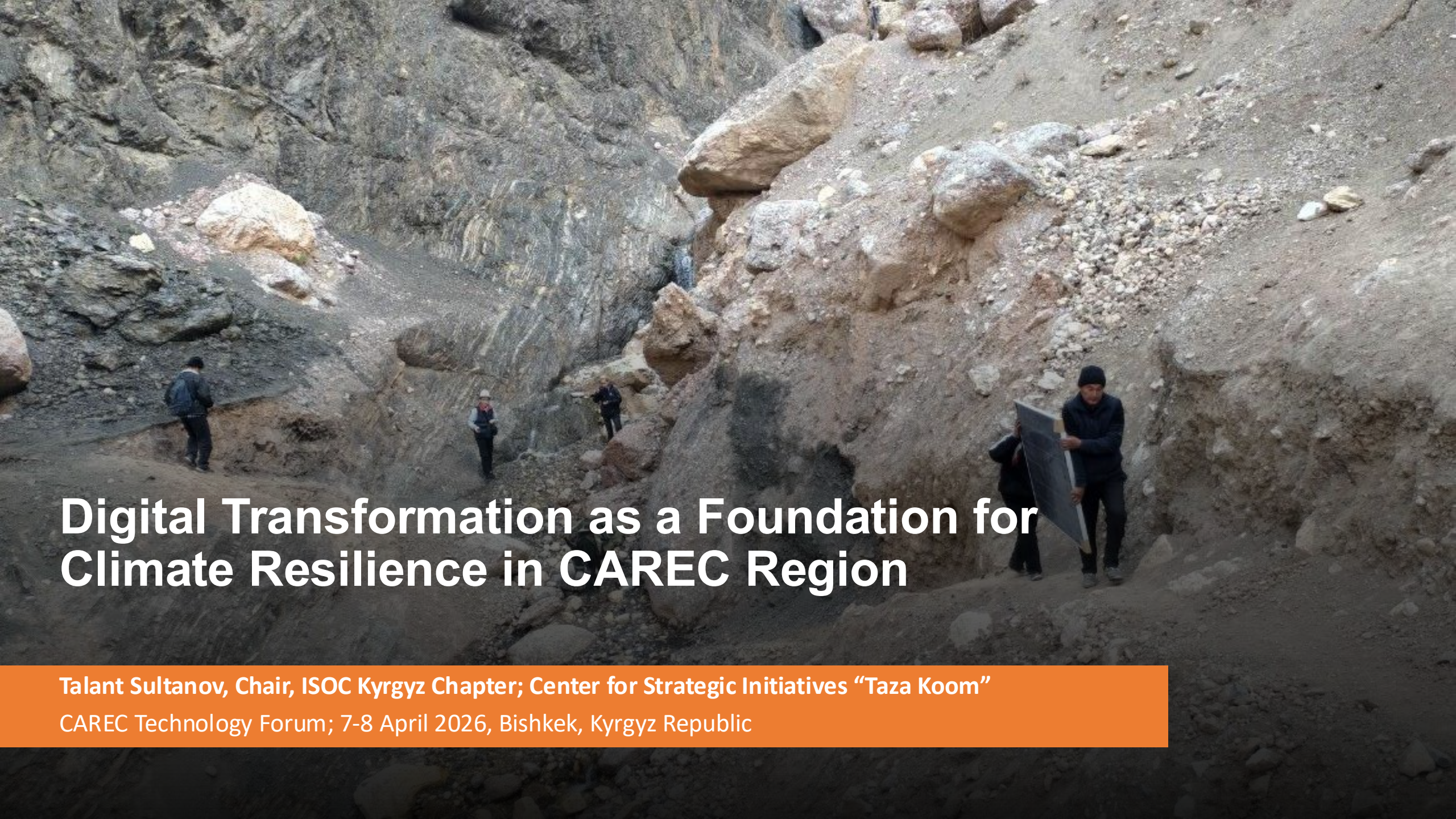


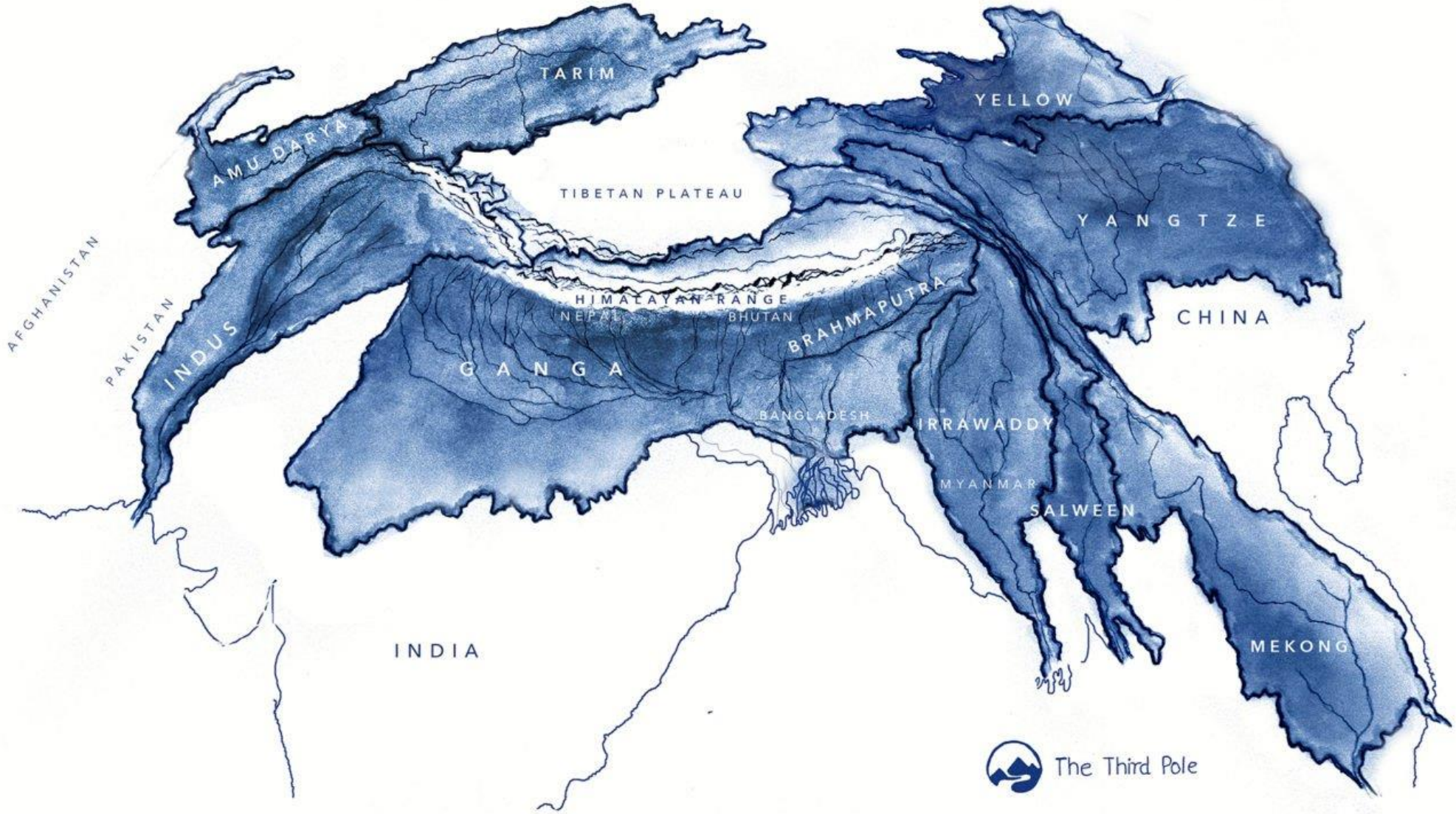
Digital Transformation as a Foundation for Climate Resilience in CAREC Region

Talant Sultanov, Chair, ISOC Kyrgyz Chapter; Center for Strategic Initiatives “Taza Koom”

CAREC Technology Forum; 7-8 April 2026, Bishkek, Kyrgyz Republic

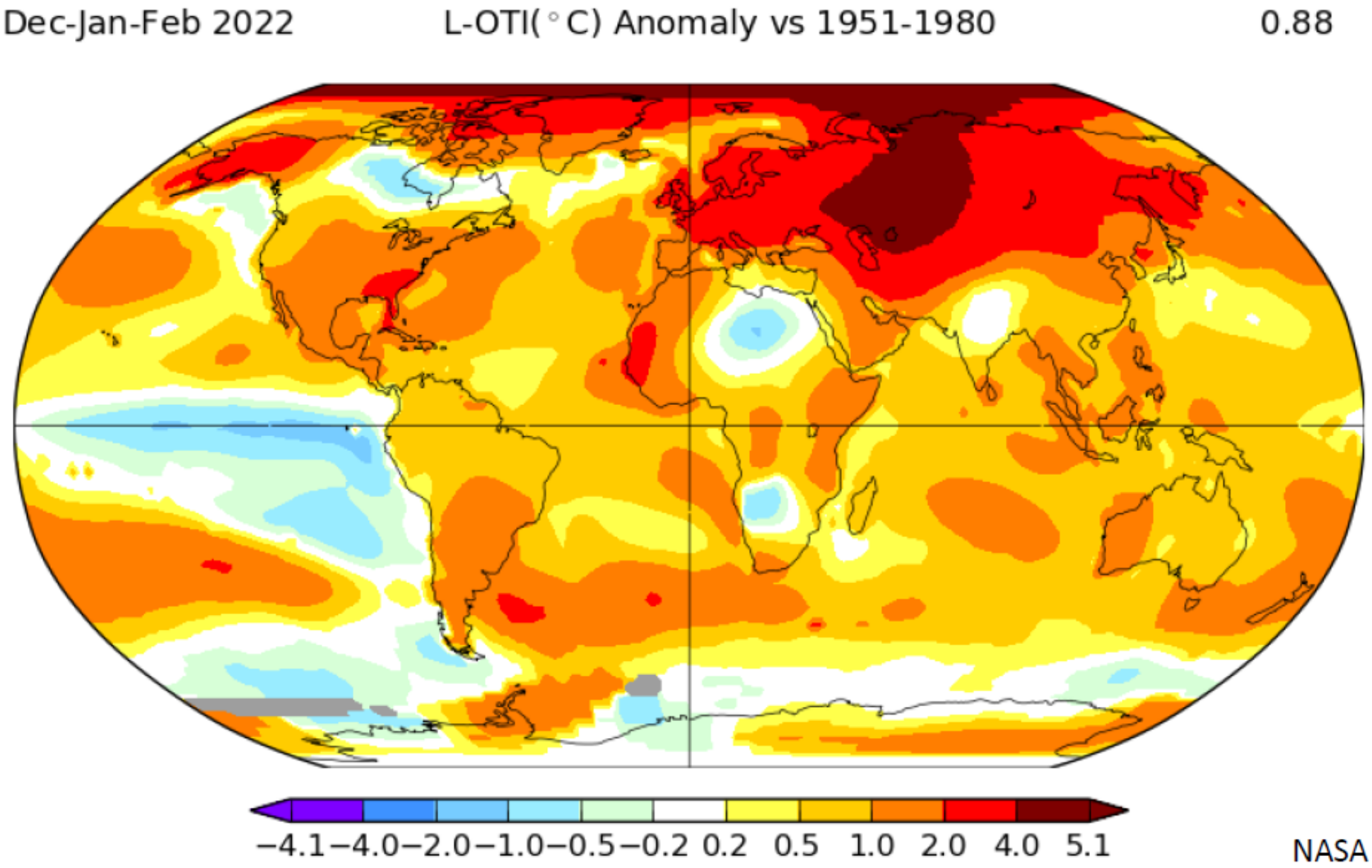
CAREC is Home to the Third Pole:

largest reserve of freshwater outside the polar regions with 10 rivers that provide irrigation, power & drinking water to quarter of global population

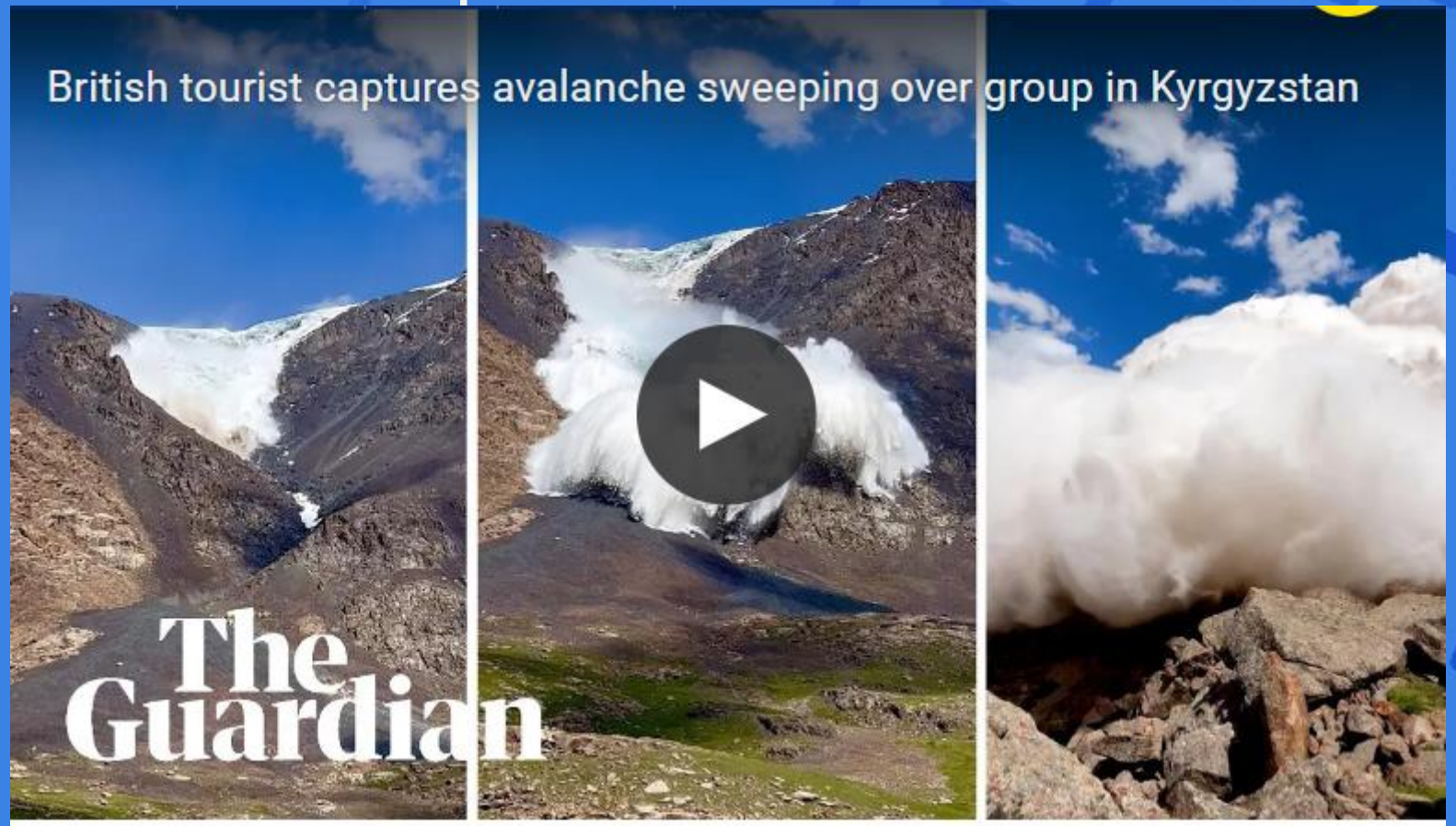


CAREC Countries Hit Hardest by Climate Crisis

(While having minimal negative impact per capita)



Climate crisis causing disasters, glaciers melting, water shortages
How can tech help with climate resilience in CAREC?



▲ British tourist captures avalanche sweeping over group in Kyrgyzstan – video

Kyrgyzstan

British tourists survive avalanche in Tian Shan mountains of Kyrgyzstan

Complex Region for Digital Transformation

- Diverse
- Complex Terrain
- Landlocked
- Harsh Climate
- “Sanctions-locked”
- “Brain-drained”

Lack of climate data
due to absence of power & digital infrastructure

Cellular network coverage in Kyrgyzstan (areas in pink color) showing that rural areas with low population density and remote areas are not served

Accelerate Climate-Smart Technologies for Resilient Development by Closing the Digital Divide

Access and Affordability

Relevant Products & Tools

Digital Literacy and Skills

Safety and Security

Data and Insights

Global Digital Inclusion Partnership

Use Cases from CAREC Region

1. Access and Affordability:
Community Networks

2. Relevant products & tools:

ilimBox educational portal in local languages

3. Digital Literacy & Skills:
Sanarip Insan for Women & Youth in Rural Areas

4. Safety & Security:

Discover Technology (DiscoTech) during Girls in ICT Days

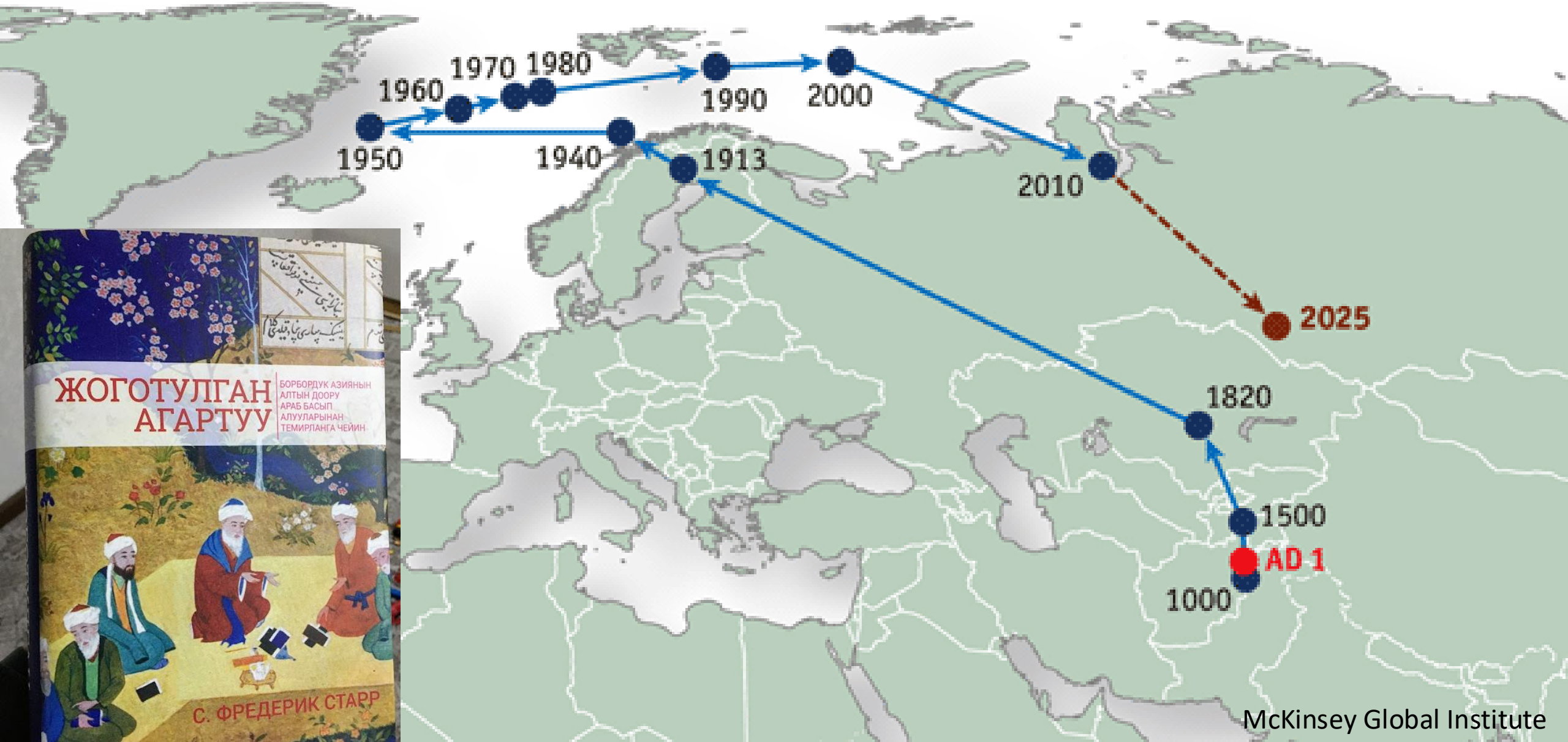
5. Data & Insights:

IoT/LoRaWAN Climate Sensors for Disaster Resilience

Digital Bridge: South & North, West & East

Evolution of the earth's economic centre of gravity **CAREC Region**

AD 1 to 2025



McKinsey Global Institute

Conclusion

Main Principles 4 Climate Resilient Digital Transformation:

1. Girls First
1. Rural First
1. Mobile First
1. Local Language First
1. Green First

Extra Slides for Q&A

IoT/LoRaWAN 4 Climate Monitoring

Stationary Weather Stations

Expensive: $80K

Heavy

Need electricity

Need communications

Personnel

Frequency of data collection

Limited set of measurements

Only ~80 stations in Kyrgyzstan

IoT LoRaWAN

Inexpensive

Lightweight

Long-lasting batteries (10yrs)

Long-range communications

Autonomous

Real-time data

Wide range of sensors

Unlimited # of sensors

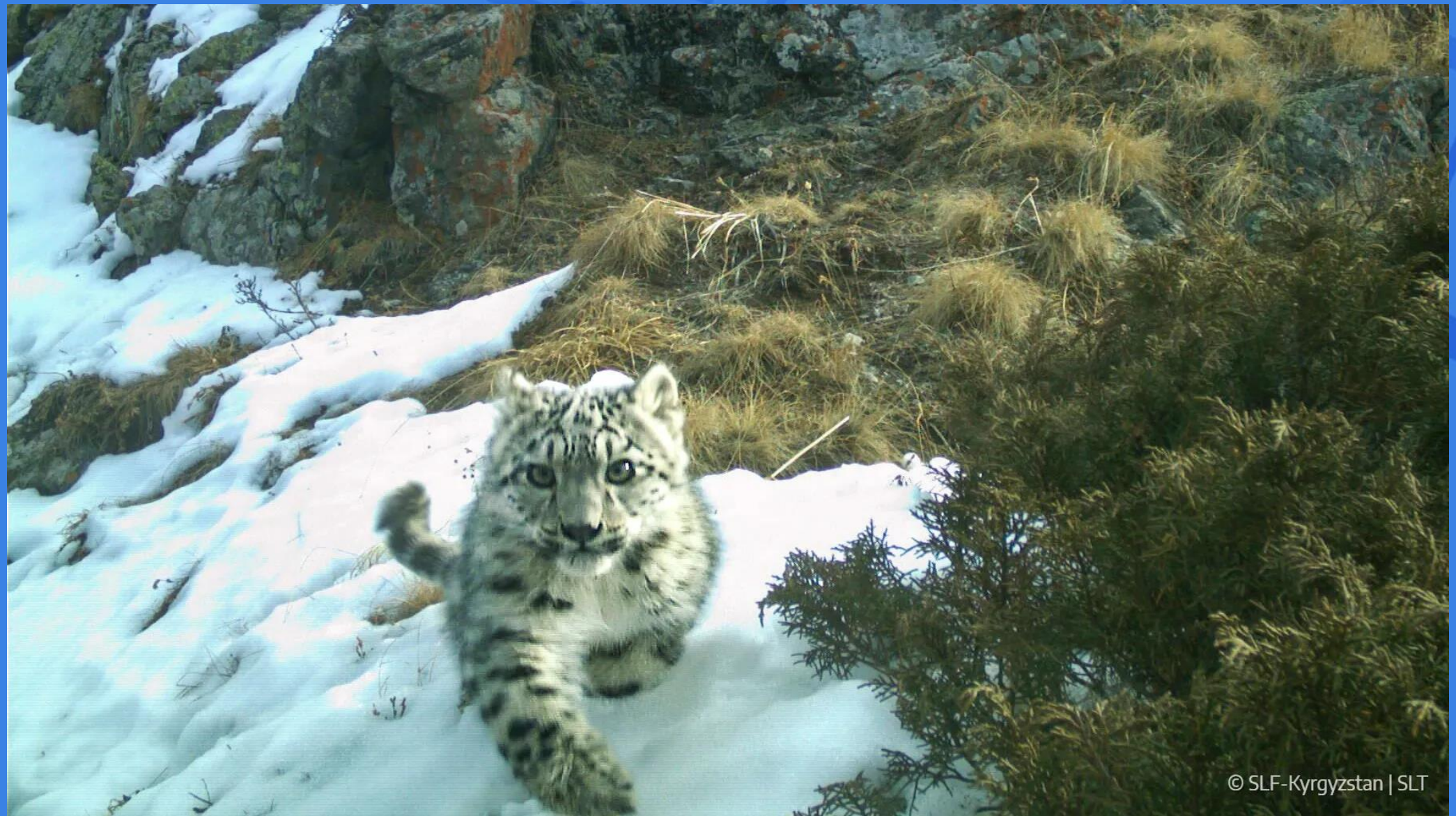
Comparing weather stations

Landslide Monitoring

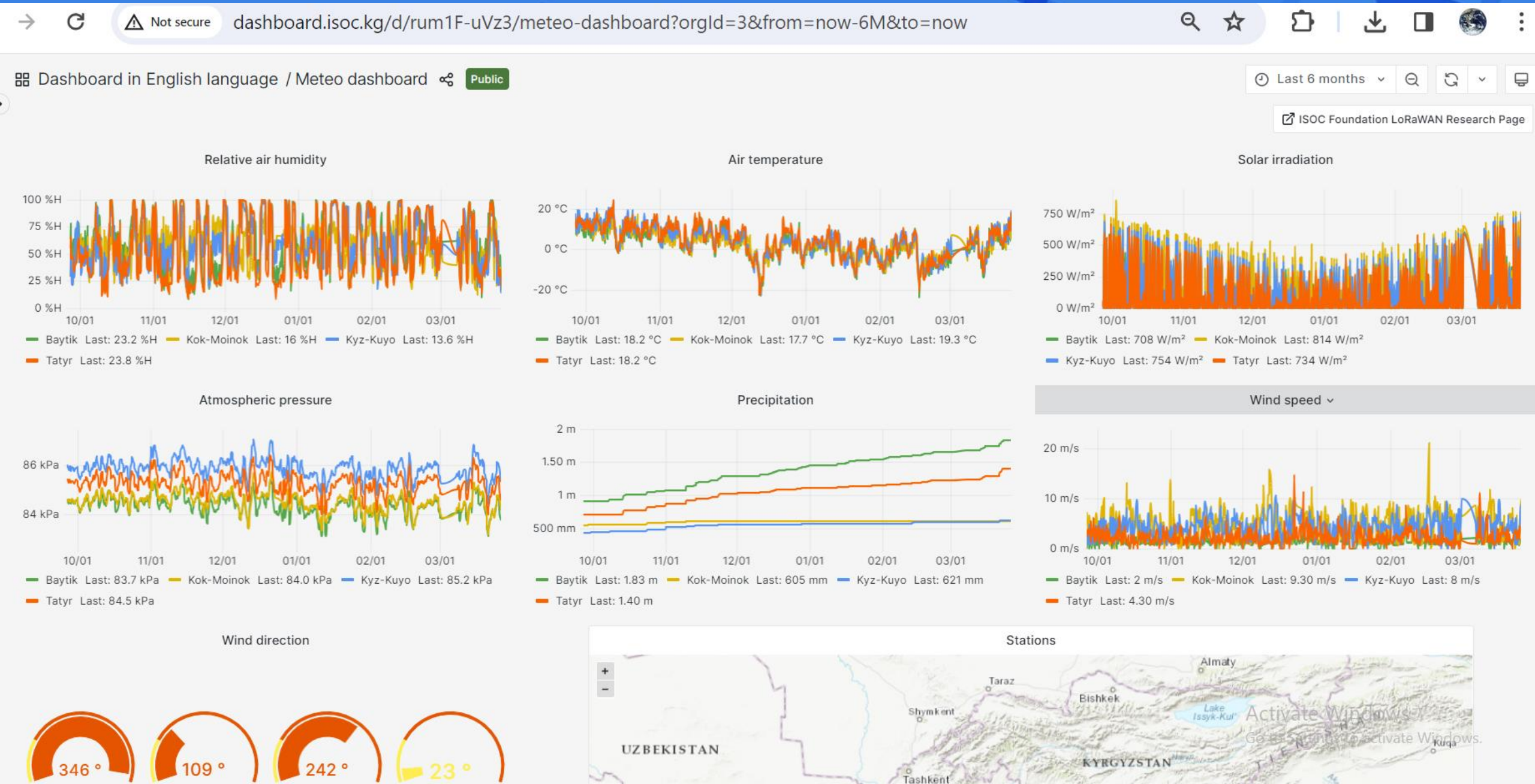
Floods Forecasting

Mountain lake outburst prevention

Wildlife Tracing, Smart Agriculture, etc.



Insights: Dashboard for Monitoring Centers and Mobile Apps



Insights

- IOT/LoRaWAN technology provides good opportunity to monitor locations with no/low cellular connectivity
- Well suited to operate well in extreme weather conditions
- Adoption of 2nd tier weather stations provides an opportunity for monitoring wider audiences with lower budgets
- Mountainous areas are challenging for communication, both wired and wireless, but they also offer opportunities for long distance wireless, by using high altitude sites and leveraging diffraction in sharp edges.
- Soil moisture and temperature sensors using resistant measuring method are not well suited for rocky mountainous areas
- Ultrasound sensors for river water level measurements are not suited for mountainous highly turbulent rivers in steep gradient terrains
- Massive amount of generated data require machine learning algorithms to analyze and monitor natural disasters

Next Steps

Scale-Up:

Vertically & Horizontally

- **Breadth**
  - Rural <-> Int'l
    (act local – think global)
  - Building Skills

- **Depth**
  - Data Generation & Analysis
  - AI-modeling (TinyML)