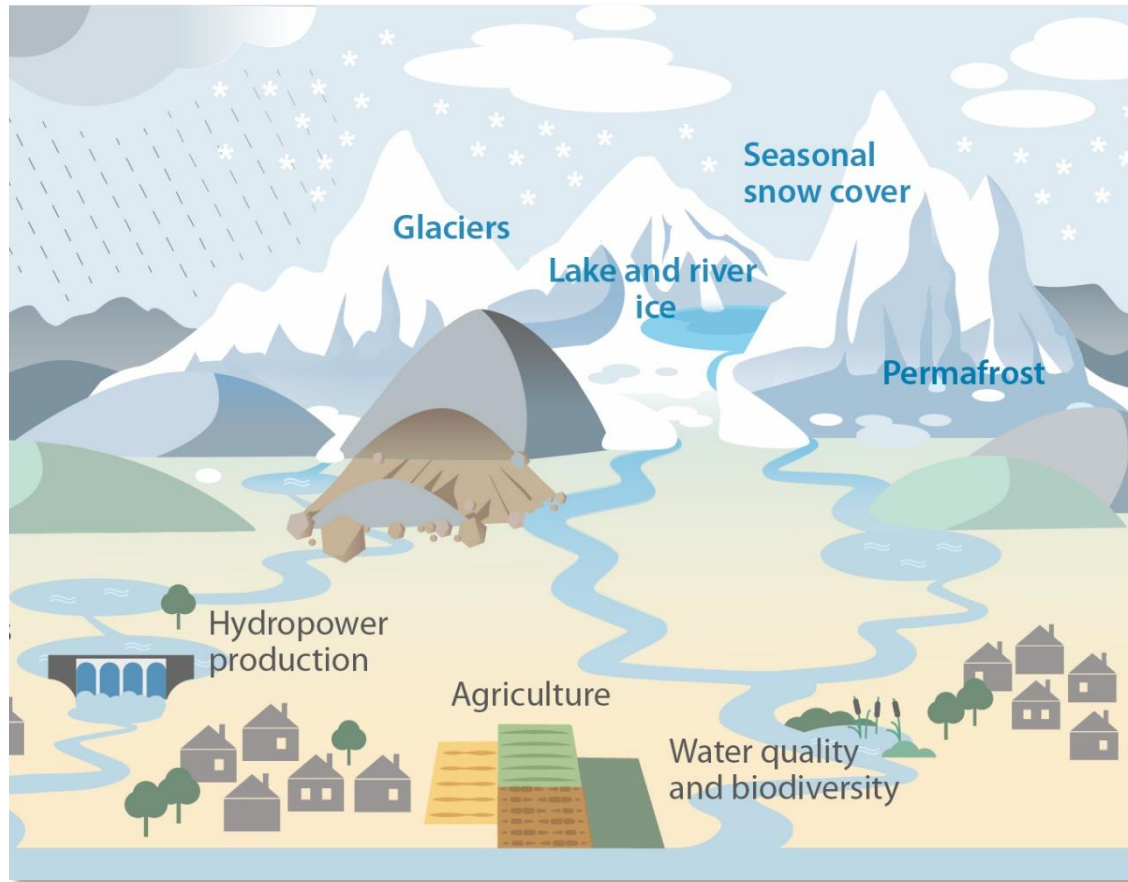




On thin ice – adapting water resources management to a vanishing mountain cryosphere

Annika Kramer, Head of Water Programme, adelphi

Mountain cryosphere – water towers for billions of people worldwide



➤ The mountain cryosphere...

- **glaciers, snow, permafrost and ice** in mountain areas
- **natural ‘water towers’** = main source of water for almost **25 % of the world’s population**

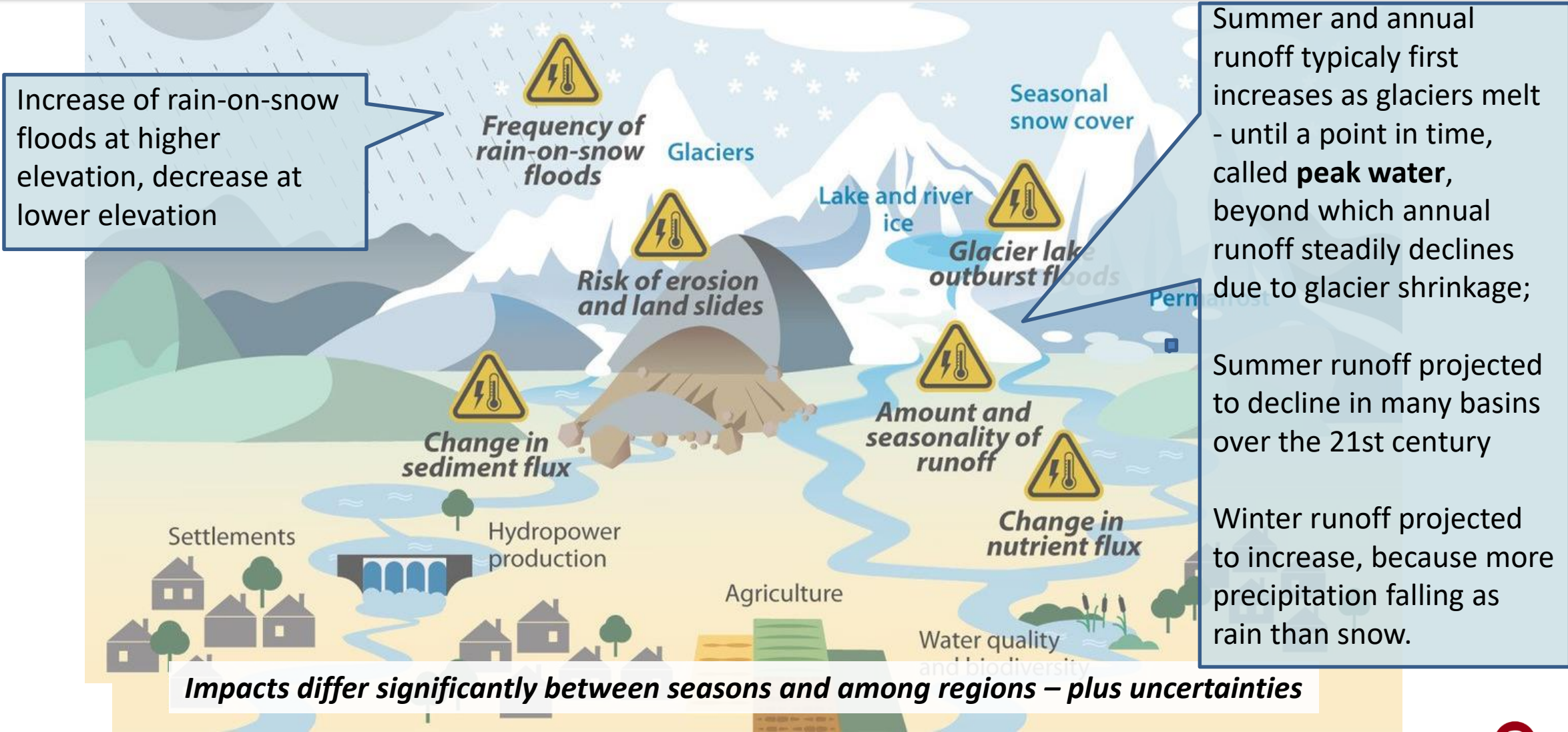


vanishing almost everywhere in the world due to global warming

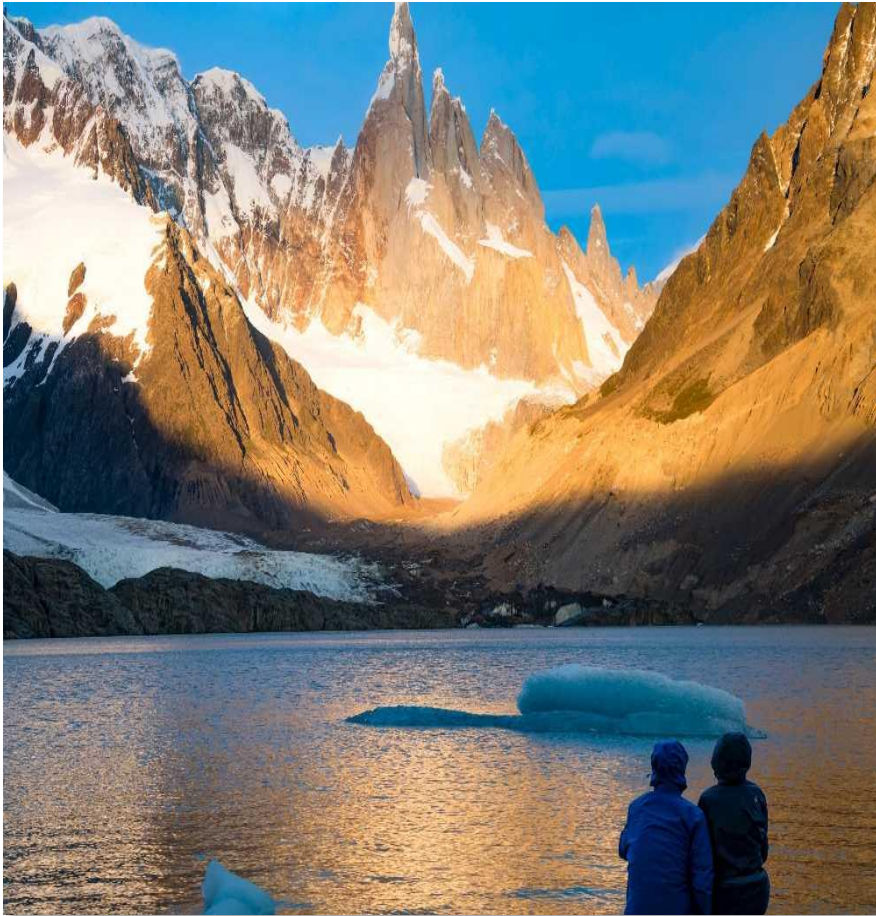
➤ The world’s **most important** cryospheric water towers are also among the **most vulnerable** to climatic and socio-economic changes. Among the most vulnerable:

- Asia: Indus, Tarim, Amu Darya
- South America: Chile-Patagonia-South and Negro

How do climate change effects on the mountain cryosphere impact freshwater resources?



Adapting water management to uncertain change in mountain areas – integrated risk assessments



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- In the face of **remaining uncertainty**, water management needs to be based on **integrated assessments** of climate related risks
 - Projections of **regional climate change effects** and **socio-economic developments** need to be considered
- Recently developed **methods and tools** include:
 - Climate, Environment and Disaster Risk Reduction Integration Guidance (**CEDRIG**) tool developed by SDC
 - Climate Risk Informed Decision Analysis (**CRIDA**) approach by UNESCO and partners
- **Data availability is often a challenge** in risk assessments
 - In **transboundary settings**, this is further complicated if relevant data is not shared among riparian countries

Adapting water management to uncertain change in mountain areas – measures to increase resilience



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- Risk assessments help to better factor in uncertainties – but they **cannot eliminate uncertainties**
- Therefore need to adopt **robust solutions** that perform well over a wide range of climate (and non-climate) scenarios
 - **Multiple-benefit solutions, or so-called no-regret solutions** provide benefits irrespective of negative climate change impacts (e.g. water demand management or conservation of wetlands for water storage)
 - **Reversible or flexible solutions** can be adapted to changing conditions (e.g. governance approaches such as water pricing or other incentives for more efficient water use)

Need for more transformational change



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- High **mountain cryosphere is expected to change fundamentally**
 - Profound alteration of the hydrologic regime, glaciers to disappear irreversibly
- Incremental adaptation of water resources management will likely be insufficient
 - More substantive, systemic changes may be needed: **transformational adaptation**
- Decision makers should **anticipate** radical climate change impacts, **assess** at what point transformational approaches are needed, and **prepare**
- There is a **substantive need to develop and better study** transformational adaptation
- Main challenges include **overcoming technical path dependencies** and bringing about **institutional and societal change**

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Thank you!

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