

Press Release, 9 March 2023

Adapting to climate change challenging for Upper Indus Basin (UIB) if 1.5°C limit crossed: report

International research team finds that rising temperatures will limit adaptation options in Islamabad, Pakistan, with implications for the wider Upper Indus Basin (UIB).

Case studies in the Iberian Mediterranean, Caribbean, Indus Basin and Arctic Fennoscandia have assessed capabilities to adapt to temperature rises beyond the 1.5 °C Paris Agreement threshold. These are all highly vulnerable areas, where thresholds of abrupt and possibly irreversible shifts or adaptation limits may be exceeded. Therefore, it is crucial to integrate potential temperature overshoots into adaptation planning. In close collaboration with local and regional stakeholders the EU-funded project PROVIDE has now published a review report on climate risks, adaptation needs and potentials, sharing the important findings of the case studies in these regions and cities. This will be critical knowledge for local administrators who must prepare their communities for potential Paris Agreement overshoot scenarios.

Islamabad, 9 March 2023: New [evidence](#) from the European Union's Horizon 2020 funded PROVIDE project (Paris Agreement overshooting reversibility, climate impacts and adaptation needs) run by leading climate scientists together with urban planners, and adaptation experts, shows that rising temperatures will increasingly limit the options available to adapt to climate change in Upper Indus Basin (UIB) with extreme temperatures and heatwaves, increased precipitation and flash floods, GLOFs, water scarcity, droughts, forest fires and agricultural loss expected to strain infrastructure and affect people's livelihoods.

The research emphasises that limiting global temperature rise to 1.5°C, a global goal established in the 2015 Paris Agreement, is fundamental to reducing pressures on resources, and risks to people.

While the latest findings from the Intergovernmental Panel on Climate Change tells us this goal remains within reach, a very significant gap remains between the emissions reductions that governments have committed to by 2030 and what is required to get the world on a 1.5 °C track. Without significant increases in global mitigation ambition this decade, overshooting the 1.5°C limit becomes increasingly likely, at least temporarily.

Impacts of such an overshoot will materialise globally but be particularly consequential for vulnerable regions.

"If temperatures rise over this limit, there is still an option we can bring them back down again if we can get to net zero emissions and get carbon out of the atmosphere,"



PROVIDE has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101003687.

commented Prof. Carl-Friedrich Schleussner, from Humboldt University, who leads the PROVIDE project.

“But it’s really important for people to recognise that some of the impacts that occur as a consequence of these higher temperatures – like sea level rise for example – may not be reversible. So, policy makers need to have this in mind. Reducing our emissions buys us so much on the adaptation front.”

The comprehensive review report looks at adaptation challenges in four key vulnerable cities and regions: Nassau (Caribbean small islands), Bodø, (Arctic Fennoscandia), Lisbon Metropolitan Area (Iberian Mediterranean), and Islamabad (Indus Basin). These cities and regions represent geographies where physical risks overlay with specific socio-economic vulnerabilities.

The review report has been developed in close collaboration with local and regional stakeholders in the four geographies. This gives locally grounded insights from each region in terms of climate risks, adaptation, spatial structural and strategic profiles. The report also includes summaries from regional stakeholder workshops.

Stakeholder co-development process in four Iconic Regions and Cities

To date, adaptation and urban planners do not routinely consider the implications of temporary overshoot of 1.5°C and what this would mean locally and regionally for sea level rise, flooding, extreme heat, and other extreme weather events. To increase the consideration of overshoot implications the PROVIDE project is co-developing research on temperature overshoot scenarios and their expected impacts together with local stakeholders. Together, the researchers and stakeholders get a better and more comprehensive understanding of how to best avoid these expected impacts. The findings in the reports are based on the review of relevant literature as well as stakeholder workshops undertaken by in-region experts, along with analyses of the structural profile of the urban environments in focus.

The PROVIDE approach provides an unprecedented level of detail to assess the risks of different scenarios, including overshoots of 1.5 °C, and illustrates the benefits of stringent global mitigation in terms of avoided impacts down to the very local level.

Characteristics of the vulnerable regions and cities

„The four regions have different climatic and socioeconomic settings, but they are all experiencing the consequences of climate change, including risks connected to more frequent and severe weather events “, explain Dr. Tiago Capela Lourenço (FC.ID) and Dr. Helena Gonzales Lindberg (NRI), Work Package *Iconic Regions and Cities* leads. „Despite their differences, a common feature in all the iconic regions is that the impacts from a changing climate are exacerbated by socio-economic factors, such as inequalities and the lack of financial and human capital. “

“The Upper Indus Basin (UIB) holds significant importance as the crucial water reservoir for downstream civilizations. The UIB is highly glaciated where seasonal changes create water supply for vital sectors such as agriculture and energy. This region is one of the recognised hotspots of climate change vulnerability. Climate Change in UIB translates into several devastating events. These range from floods, glacial lake outburst floods, as well as droughts and heatwaves in downstream regions including Pakistan. A multitude of distressing impacts arise from such events, including destruction to infrastructure, hefty



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economic losses, population displacement, disruption of agricultural productivity, and public health crises, challenging further the currently limited adaptive capacity and constrained economics resources of the country. The expected increase in frequency, intensity, and persistence/duration of these extreme events are likely to increase risks in both urban and rural areas, causing human and other ecosystems to be pushed towards the limits to adaptation. For Islamabad, the rapid development and expansion of the city is noted to be putting pressure on the green structure. The recent rising trends in temperature has increased the incidence of flash floods and heatwaves, affected public health and lowered labor productivity. The way the city's spatial structure is evolving increases these risks and makes spatial adaptive measures more difficult", is explained in the review report on climate risks written for the Upper Indus basin and Islamabad. The review report on Upper Indus Basin and Islamabad takes a deep look into climate susceptibility of the region, which presents a clear need of concentrating dedicated and informed resilience interventions in the region.

Reversing the impact chain to define suitable countermeasures

"Incorporation of potential overshoots into adaptation planning is crucial to avoid maladaptation", says Prof. Carl-Friedrich Schleussner.

PROVIDE delivers climate services that incorporate comprehensive information on impacts under overshoot pathways, from the global to the regional and urban levels into adaptation planning. The research project innovates the appraisal of adaptation needs by first focussing on critical (local) impact thresholds and then 'reversing the impact chain' so that researchers and adaptation practitioners can identify under which conditions these impacts can be avoided. This novel approach, named the PROVIDE Overshoot Proofing Methodology, is co-developed with stakeholders and facilitates responsiveness to their needs.

The PROVIDE project aims to deliver information on a range of different climate scenarios and respective impacts in the context of adaptation through an innovative web tool, the [PROVIDE Climate Risk Dashboard](#). With the Dashboard, users can assess the risks of overshooting systemic thresholds, such as glacier melt or sea level rise, from the local to the global level. Moving beyond a limited set of climate scenarios, the PROVIDE approach allows you to make thresholds the starting point for the analysis and adaptation planning.

[Link to the regional report on Upper Indus Basin and Islamabad](#)

[Link to the full report](#)

[Link to PROVIDE-UIB homepage](#)

First version of the PROVIDE Climate Risk Dashboard has already been launched

With the launch of the first version of the innovative [PROVIDE Climate Risk Dashboard](#) another important project milestone has been reached. This interactive, open access web tool displays the impacts of climate change on human activities and industries under a range of different policy relevant scenarios.

Built for a variety of users such as adaptation practitioners and local administrators, the PROVIDE Dashboard uses high-resolution modelling on a variety of spatial scales, allowing climate impacts to be explored under different global warming scenarios. It is designed to guide informed decision making for specific regional settings and risk profiles as it enables user-defined threshold and risk appraisals for the concrete area(s) of interest. During the next 18 months more data will be added, based on the assessments of risks of overshoot global warming scenarios. The final version will be available in 2024. The PROVIDE Dashboard is co-developed with practitioners, scientists, litigation experts,



businesses, civil society, and other potential users. If you are interested in becoming a beta-tester, evaluating the dashboard, please register under [this link](#).

PROVIDE Background

PROVIDE is a breakthrough innovation project funded with 5.9 million euros for 36 months (2021 – 2024) by the European Union’s Horizon 2020 framework programme. Coordinated by the Humboldt-Universität (Germany), the interdisciplinary PROVIDE consortium comprises 17 partners and combines internationally recognised scientific excellence, including experts that have served as lead authors in recent IPCC reports. This scientific excellence in climate science is brought together with leading adaptation experts including on regional strategies and adaptation costing approaches on urban modelling and planning as well as comprehensive climate services and stakeholder engagement expertise. The whole consortium is supported by the management consulting partner ARTTIC Innovation GmbH and accompanied by a Stakeholder Advisory Board.

Project Partners

Humboldt-Universität zu Berlin (Germany)

Climate Analytics (Germany)

VITO (Belgium)

BUUR part of Sweco (Belgium)

CICERO (Norway)

CEA-LSCE (France)

FCiências.ID (Portugal)

Weather and Climate Services (Pakistan)

ETH Zürich (Switzerland)

Universität Bern (Switzerland)

Imperial College London (UK)

Universität Innsbruck (Austria)

University of East Anglia (UK)

ARTTIC Innovation (Germany)

Nordland Research Institute (Norway)

University of British Columbia (Canada)

Universität Hamburg (Germany)

For more information, visit <https://www.provide-h2020.eu/>

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