ICIMOD

# Climate services in the HKH region for informed decision making

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# Key Issues in the HKH region

Multi-hazard environment

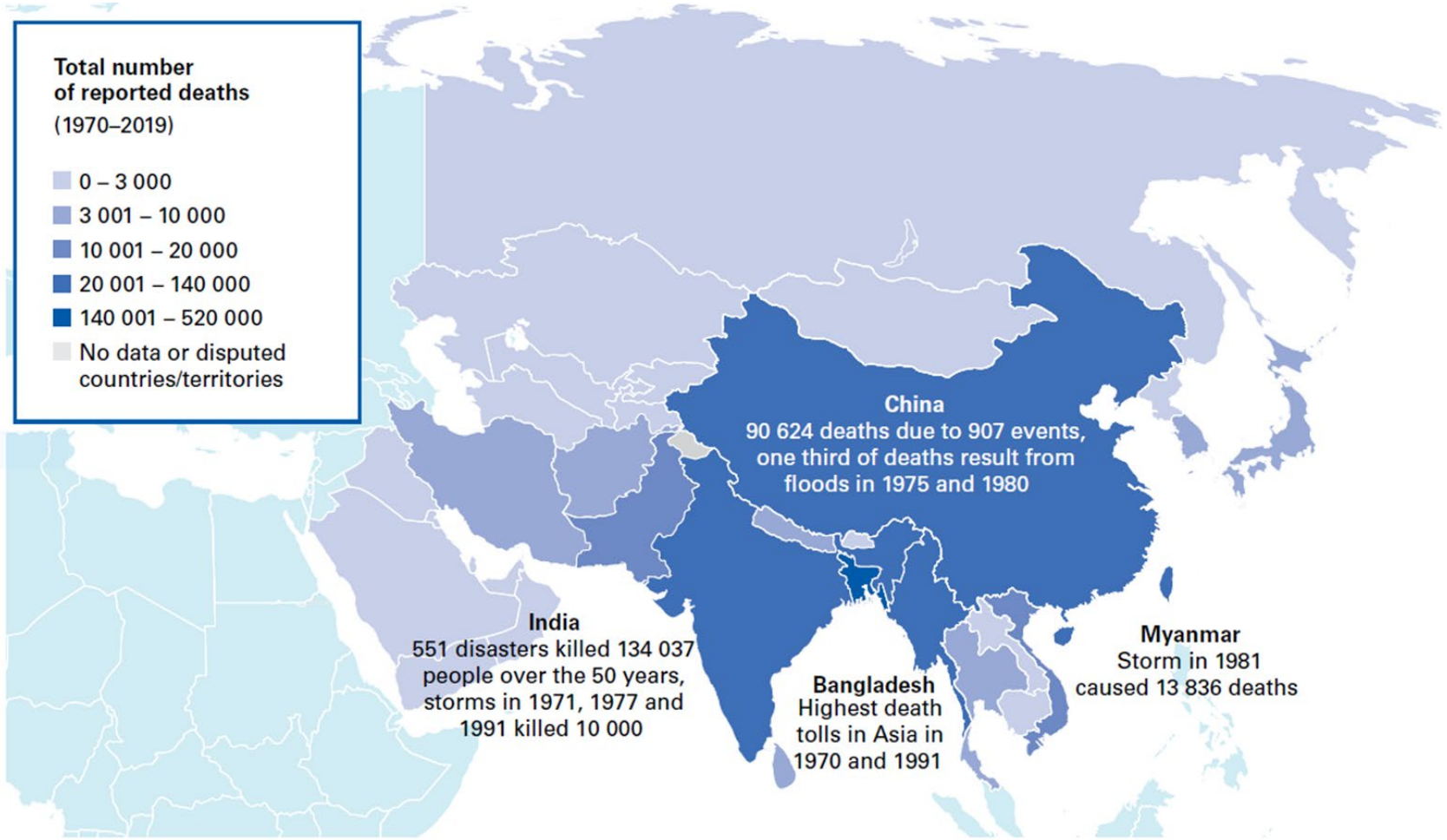
Upstream-downstream linkages

**Climate change and variability**

Connectivity and physical access

Governance

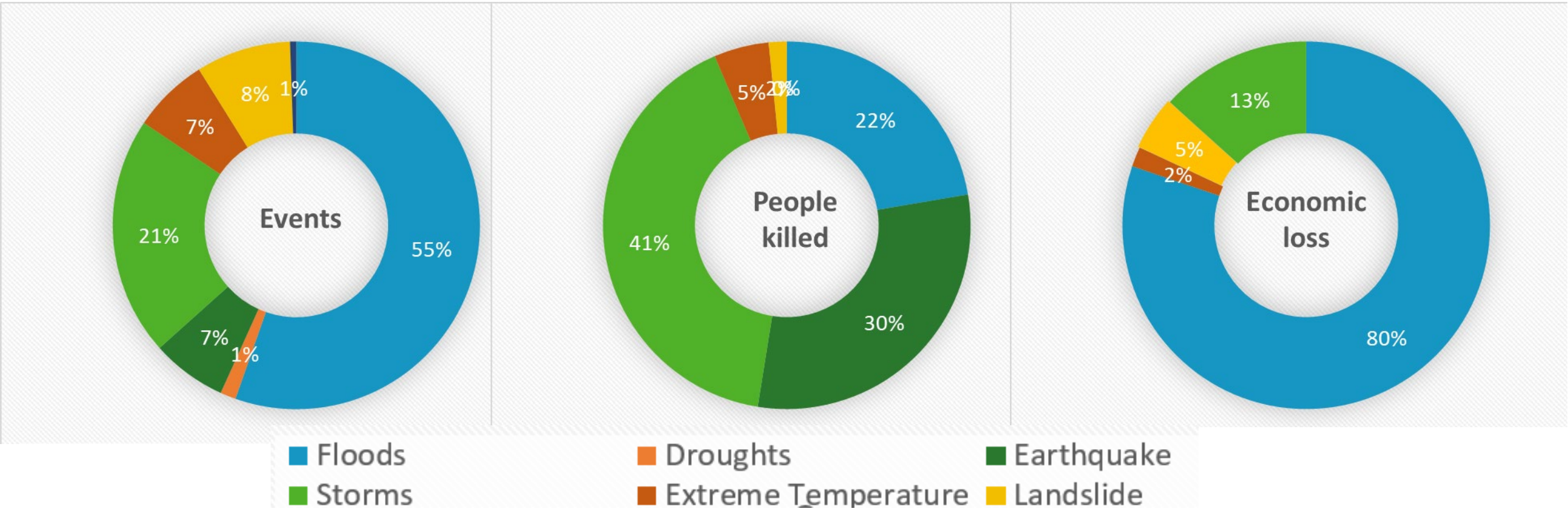
# Hindu Kush Himalayan region is prone to disasters




More than 1 billion people are at risk of exposure to increasing frequency and intensity of natural hazards

Source: WMO, 2021

# Disasters in the HKH (1980-2020)




Source: EMDAT CRED Database

# Challenges

Increase in intensity and frequency of disasters

Inadequate climate observing network

Lack of sharing of data and information

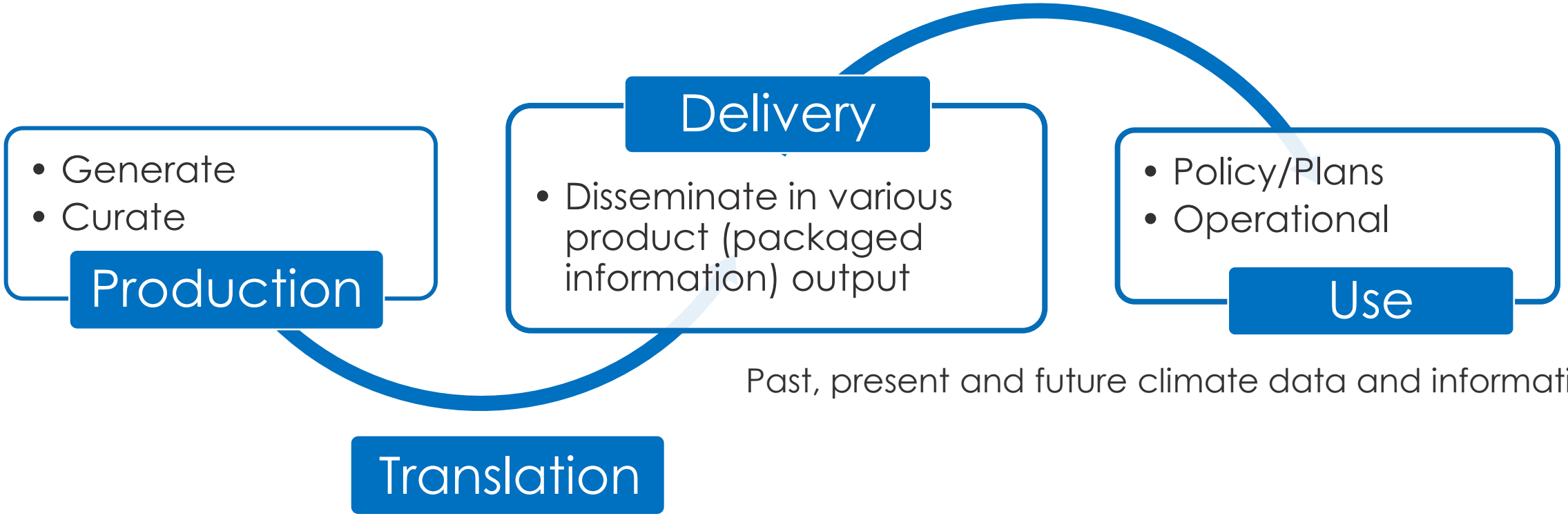
Inadequate and varying capacity

Limited tailored climate services that is actionable and gender responsive.

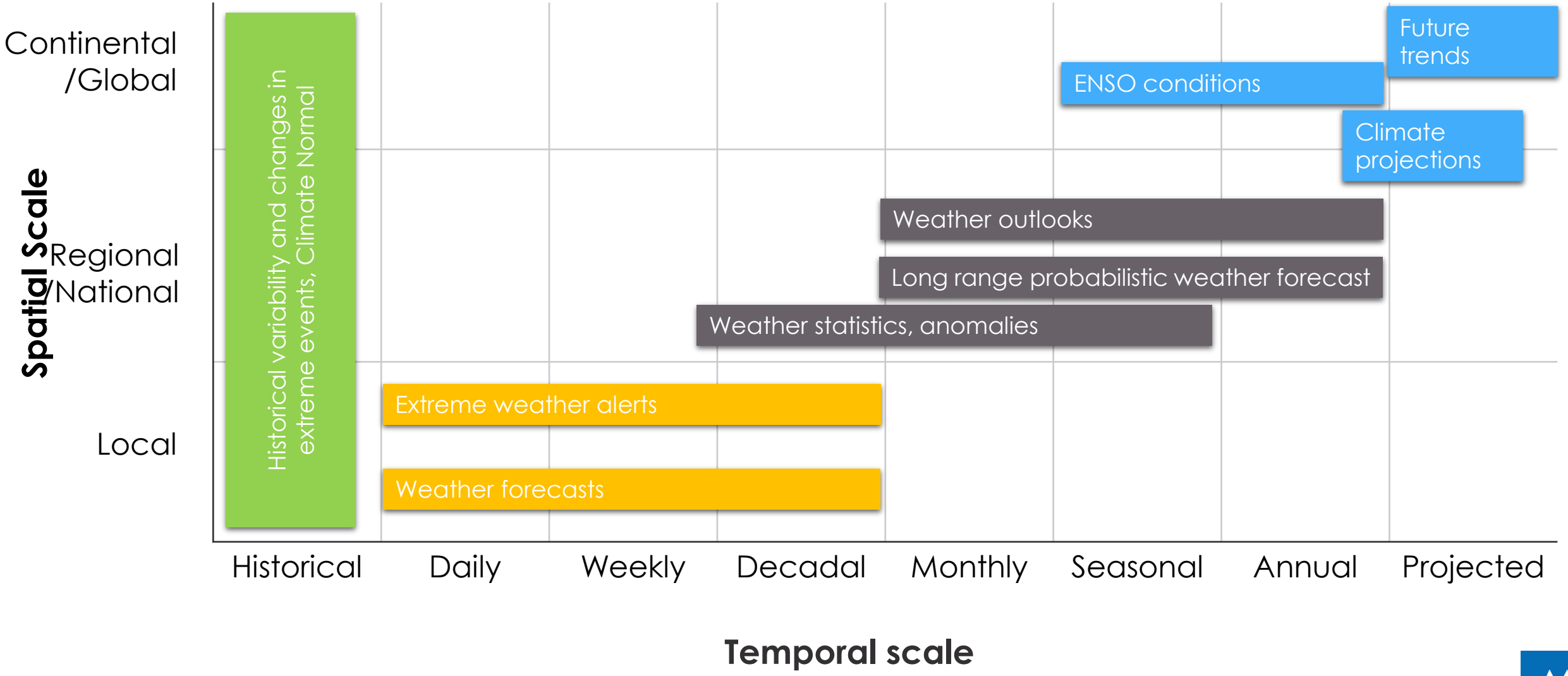
Kantipur Publications/Abdhesh Kumar Jha

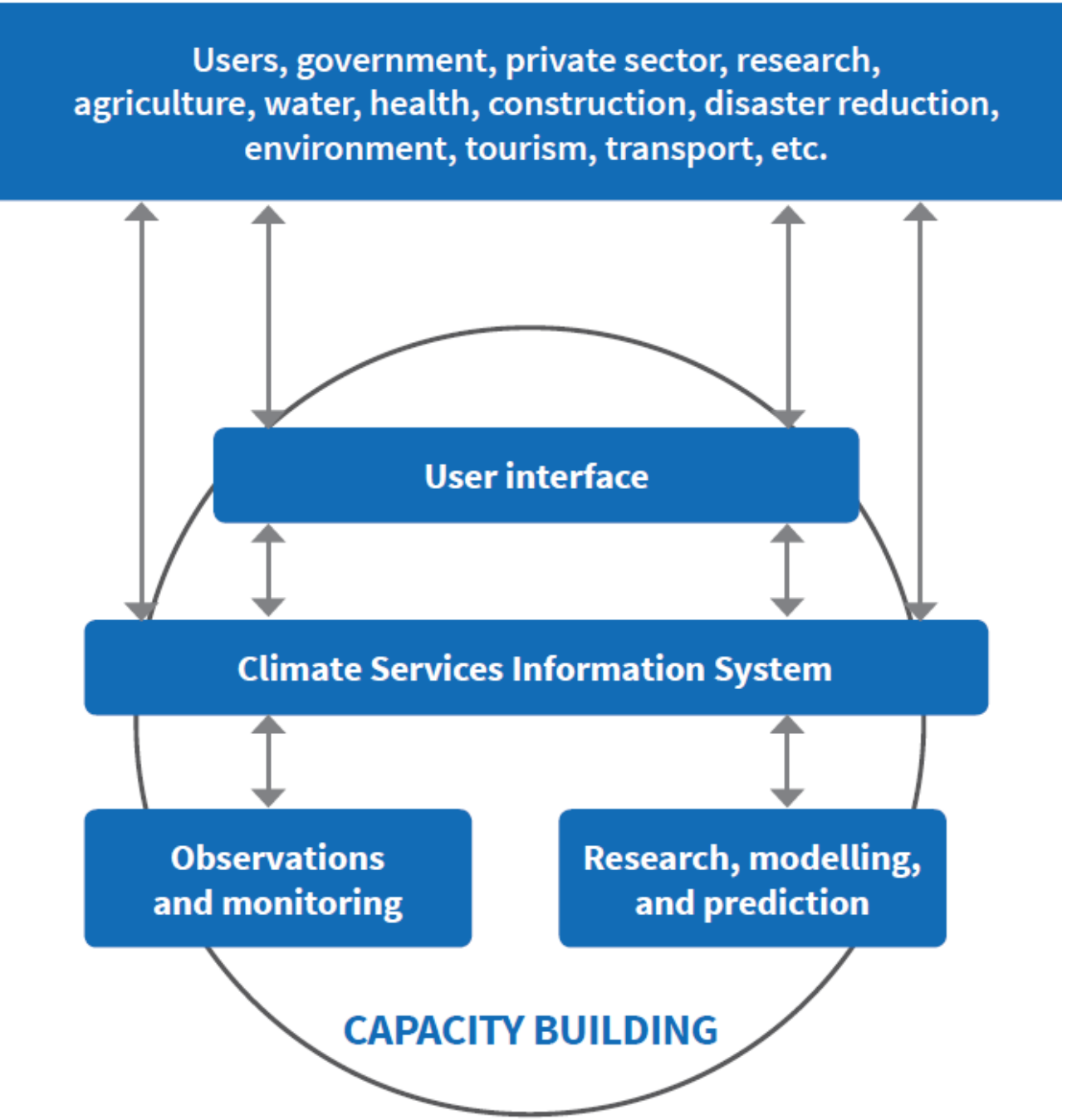
# What is climate service?

**Science-based information and forecasts that empower decision-makers at different levels to anticipate and manage climate related shocks and avail opportunities.**



# Climate services: Spatial and temporal






# Global framework for climate services

five pillars of GFCS

to support more robust adaptation planning and policy decisions

increasing resilience to climate change

Implementation Plan of the Global Framework for Climate Services

# Climate risk sensitive growth sectors

**Agriculture: Climate change is detrimental to agriculture systems.**

**Tourism**

**Water and energy**

**Health**

**Disasters – floods, droughts, forest fire, extreme temperatures/heat waves, air pollution**

**Results in loss of productivity, infrastructure, property and lives.**

# Climate Services Initiative

**Impact:** Improved livelihood and enhanced resilience of mountain communities as a result of reduced risks and vulnerabilities with the use of climate information services.

**Outcome:** Improved capacities of mandated institutions and understanding of end users in making best use of climate information services for decision making and long-term resilience building.

**Change pathways:**

- Build partnerships and user interface
- Co-develop services
- Strengthen capacity

# Needs and priorities in the HKH (ARRCC)

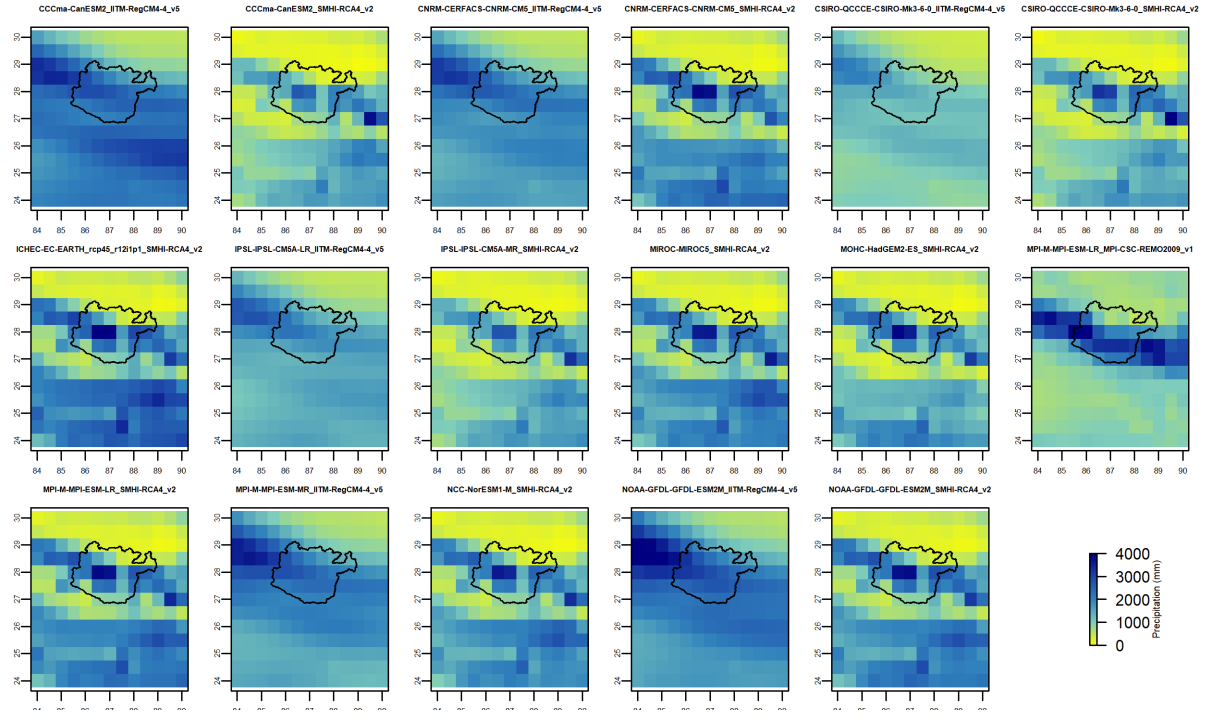
To bridge the gap between climate information providers and users

- Strengthen capacity in the use of advanced tools in forecasting and data assimilation: impact-based forecasting, seasonal outlooks and climate projections
- Build Institutional capacities in the access and use of Climate change projections
- Co-develop and tailor climate information to the needs of specific users for societal benefits
- Awareness, enhancing capacity, communication and dissemination of climate information to various types of users (language, sociocultural norms and mode)

# Spatial and temporal climate change analysis using CORDEX datasets

Prepare CORDEX data sets in areas of interest and compare them with reference (APHRODITE) data sets

Visualize spatial and temporal variation in climate change projections



# Climate Indices

Climate indices are important metrics that assist in the analysis of regional and global datasets for e.g. extremes in meteorological events

Assessment of sectoral impacts (e.g., Agriculture, Health, Energy, Water Resources and Hydrology)

Expert Team on Sector-specific Climate Indices (ET-SCI core and non-core) adopted by the World Meteorological Organization (WMO)

| Short name | Long name | Definition | Plain language description | Units | Time scale | Sector(s) |
|---|---|---|---|---|---|---|
| FD | Frost Days | Number of days when TN < 0 °C | Days when minimum temperature is below 0°C | days | Mon/ Ann | H, AFS |
| TNlt2 | TN below 2°C | Number of days when TN < 2 °C | Days when minimum temperature is below 2°C | days | Mon/ Ann | AFS |
| TNltm2 | TN below -2°C | Number of days when TN < -2 °C | Days when minimum temperature is below -2°C | days | Mon/ Ann | AFS |
| TNltm20 | TN below -20°C | Number of days when TN < -20 °C | Days when minimum temperature is below -20°C | days | Mon/ Ann | H, AFS |
| ID | Ice Days | Number of days when TX < 0 °C | Days when maximum temperature is below 0°C | days | Mon/ Ann | H, AFS |
| SU | Summer days | Number of days when TX > 25 °C | Days when maximum temperature exceeds 25°C | days | Mon/ Ann | H |
| TR | Tropical nights | Number of days when TN > 20 °C | Days when minimum temperature exceeds 20°C | days | Mon/ Ann | H,AFS |
| GSL | Growing Season Length | Annual number of days between the first occurrence of 6 consecutive days with TM > 5 °C and the first occurrence of 6 consecutive days with TM < 5 °C | Length of time in which plants can grow | days | Ann | AFS |
| TXx | Max TX | Warmest daily TX | Hottest day | °C | Mon/ Ann | AFS |
| TNn | Min TN | Coldest daily TN | Coldest night | °C | Mon/ Ann | AFS |
| WSDI | Warm spell duration indicator | Annual number of days contributing to events where 6 or more | Number of days contributing to a warm period (where | . | . | H, AFS, WRH |

Source: Mistry, 2019

JTS Viewer

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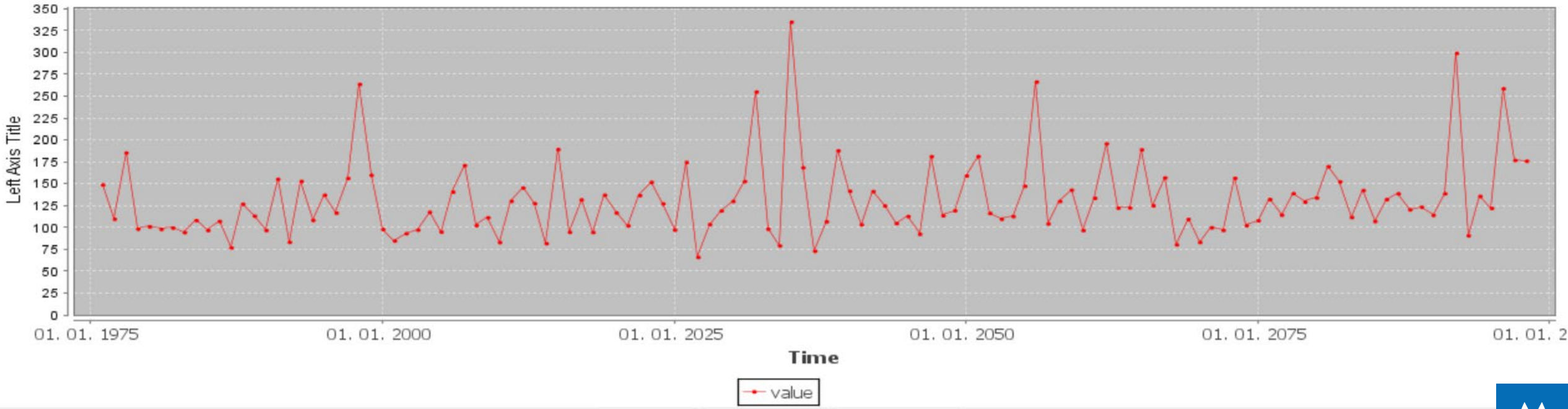


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# Institutional capacity building: climate projections

**Stakeholder consultation and need identification**

- Identification of the needs and priorities through regional and national consultations held in 2019
- Online survey for training need identification

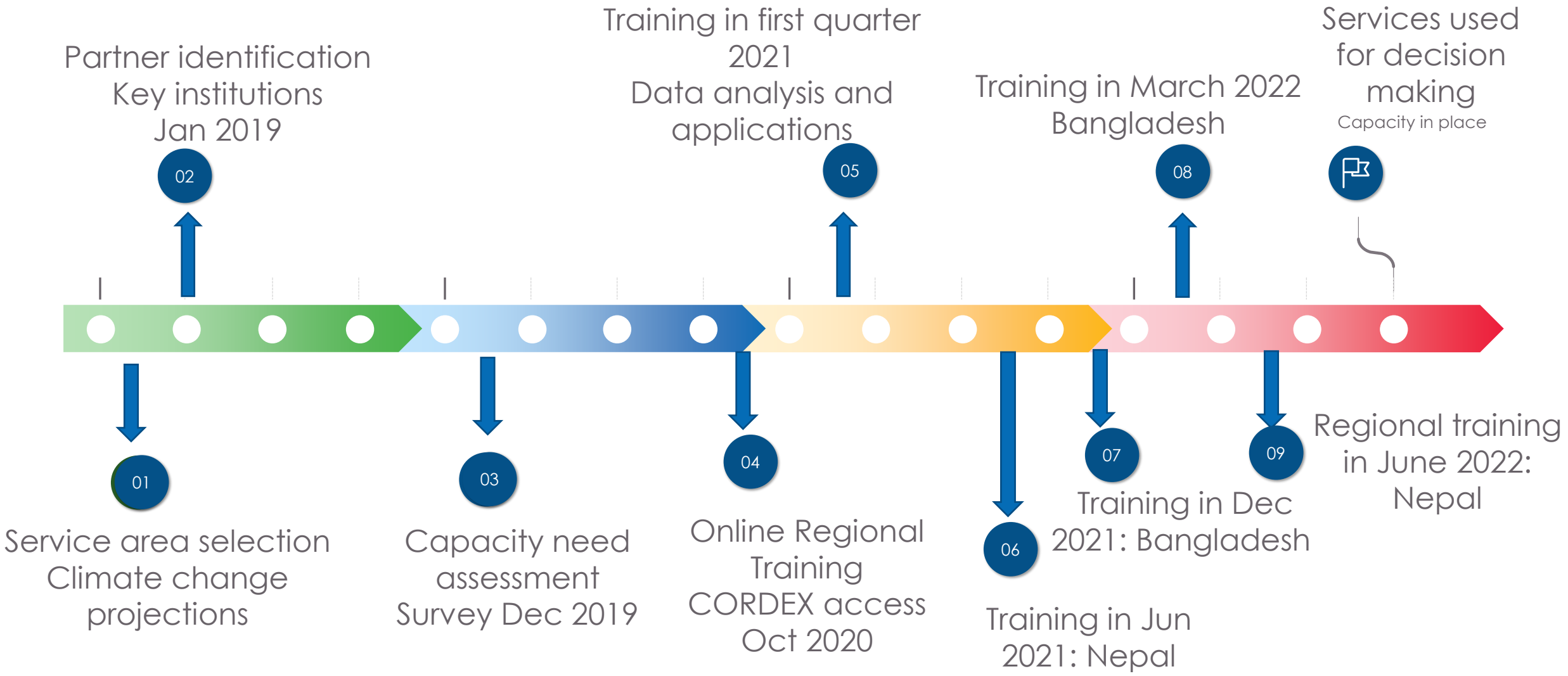
**International and regional partnerships**

- UK's Met Office, World Climate Research Programme (WRCP), IITM-Pune

**Dedicated institutional capacity building approach**

- Partnership from the beginning (shared vision and commitments)
- National hydro-meteorological agencies on board (Afghanistan, Nepal, Bangladesh, Pakistan)
- Series of capacity building activities planned for 2020-2022
- Development of software's and tools
- **Co-generating knowledge** to develop national climate change projections and sectoral implications

# Institutional capacity building approach



# Training programme

**Objective:** The training aims to build knowledge and skills for analysing climate indices using CORDEX regional climate model simulations

| Date | Description |
|---|---|
| DAY 1<br>21 June | Pres-assessment survey, installation of softwares, Introduction of participants, Concepts of climate change indices by IITM and reflection and review of the earlier trainings |
| DAY 2<br>22 June | Introduction to climate data indices tool and data extraction, Presentations on bias correction by SMHI and Met Office |
| DAY 3<br>23 June | Climate indices calculation for selected models<br>Climate indices analysis |
| DAY 4<br>24 June | Uncertainty analysis<br>Group work on areas of interest and presentations |

# Expected outcomes

- Selection of representative models for their defined area of interest.
- Extract CORDEX datasets for their areas of interest and analyse them separately.
- Spatial and temporal visualization of climate indices over their defined area of interest.
- Interpret the uncertainty of the selected model results.


Thank you
Let’s protect
the pulse.