# UAE-Belém work programme on indicators / Information on existing indicators for measuring progress towards the targets referred to in paragraphs 9–10 of decision 2/CMA.5 in use at the local, national, regional and global level

Submission by the International Centre for Integrated Mountain Development (ICIMOD) July 2024

## Introduction

This submission by the International Centre for Integrated Mountain Development (ICIMOD) is in response to the invitation in conclusions by SBI and SBSTA 60 to "Parties and non-Party stakeholders, including relevant constituted bodies, United Nations organizations and specialized agencies, and other relevant organizations from all geographical regions, to submit information on existing indicators for measuring progress towards the targets referred to in paragraphs 9–10 of decision 2/CMA.5 in use at the local, national, regional, and global level.

## Background

ICIMOD is a unique knowledge and learning centre serving eight member states (Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan) – working towards a greener, more inclusive, and climate-resilient Hindu Kush Himalaya (HKH). As an intergovernmental organisation with observer status at the UNFCCC, ICIMOD takes this opportunity to amplify the case for dedicated attention to urgent and effective climate action for mountains and people, particularly in the HKH region.

## Significance of mountains ecosystems and mountains in face of climate crisis

Mountains cover 22% of the Earth's area and serve as a barometer for the planet's health. Mountains, particularly in the HKH region, are disproportionately affected by climate change due to elevation dependent warming. The HKH region has the greatest ice reserves outside the poles. Melting snow and ice in the mountains contributes significantly to sea level rise and causes cascading consequences. Mountains, despite their worldwide relevance, have not received the same attention as oceans in global processes and environmental discourse.

The HKH mountains are home to four global biodiversity hotspots and serve as water towers for 10 major Asian river systems. They provide water, ecosystem services, and livelihoods for about 240 million people in the region. These rivers' basins give water to 1.9 billion people, or one-fourth of the global population.

Unprecedented and largely irreversible changes in the Hindu Kush Himalayan cryosphere, caused by global temperature rises, endanger two billion people and accelerate species extinction. According to the IPCC's Sixth Assessment Report (AR6), glaciers worldwide have been receding at unprecedented rates since the 1950s, paralleling ice sheet loss over the past 2,000 years. The cross-chapter paper on mountains in the IPCC's AR6 report notes that climate risks are transboundary, cascading, and systemic. Weather and climate extremes have economic and societal impacts across national boundaries through supply chains, markets, and natural resource flows, with increasing transboundary risks projected across the water, energy, and food sectors. Disasters have increased in both frequency and intensity.

In the HKH, the rate of glacier loss is also alarming. Glaciers in High Mountain Asia faced an accelerated melting by 65% in the second decade compared to the first decade of this century. The report on Water, ice, society, and ecosystems in the Hindu Kush Himalaya (HI-WISE) further projects that

- on current emission patterns, 80% of glaciers' current volume will be gone by 2100. The availability of water is predicted to peak around mid-century, then fall.
- Vulnerable mountain communities are already experiencing significant adverse impacts, including loss and destruction to lives, property, history, and infrastructure.
- Floods and landslides are expected to rise.
- The impacts on vulnerable mountain environments are especially profound.

Despite the significance of mountains and the important services they provide, and the threat posed by the climate crisis to these fragile ecosystems, global recognition and funding flows have been woefully inadequate. The impacts of climate change will be unimaginably irreversible in the mountainous region such as the HKH which has millions living within in the region and 1.65 billion people living downstream.  Therefore, having specific mountain indicators will put the adaptation actions and priorities right for mountains and people living in them.

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**Potential mountain specific targets and indicators**

| Global Targets | Global indicators | Potential mountain specific targets | Potential mountain specific indicators |
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| *Significantly reducing climate-induced water scarcity and enhancing climate resilience to water-related hazards towards a climate-resilient water supply, climate-resilient sanitation and towards access to safe and affordable potable water for all* | Level of water stress: freshwater withdrawal as a proportion of available freshwater resources<br><br>Change in the extent of water related ecosystems over time<br><br>Safely managed and accessible drinking water<br><br>Number of extreme events – floods and droughts<br><br>Degree of integrated water resources management implemented. | Number of mountain communities facing water stress decreased by 30%<br><br>At least 30% increase in development and implementation of springs management plans in the mountains<br><br>Enhanced resilience of mountain water resources by managing meltwater from glaciers and snowpack for water supply in dry seasons | Number of mountain springs revival<br><br>Change in number of water accessibility populations<br><br>Changes in mountain glacier mass balance, permafrost, and snowpack<br><br>Change in the extent of mountain springshed ecosystems over time<br><br>Trends in the proportion of mountain land under drought over the total land area |
| *Attaining climate-resilient food and agricultural production and supply and distribution of food, as well as increasing sustainable and regenerative production and equitable access to adequate food and nutrition for all* | Prevalence of undernourishment<br><br>Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)<br><br>Proportion of agricultural area under productive and sustainable agriculture.<br><br>Average income of small-scale food producers, by sex and indigenous status | Reduced prevalence of undernourishment and malnutrition in the mountains with more focus on women and marginalized groups<br><br>Improved productivity and income of small-scale farmers through sustainable, resilient | % mountain population with access to diverse and healthy diets<br><br>% reduction in post-harvest losses in mountain agriculture.<br><br>% population of pastoralists and communities with difficult farming conditions covered under social protection programmes on food and livelihood security<br><br>% increase in productivity and income of small farms in mountains |

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| | Direct agricultural losses attributed to disasters | and inclusive practices in mountains. | % of abandoned/un-utilized agricultural land in mountains brought under cultivation of diverse crops<br><br>% of agricultural land in mountains with improved irrigation<br><br>Number of climate resilient, inclusive and regenerative solutions related to water, soil health, pest and renewable energy scaled in mountain agriculture<br><br>% population of women and marginal groups engaged in agricultural value chains in mountains<br><br>% households living in vulnerable mountain areas to climatic risks covered by the crop insurance scheme |
| | | Improved diversities in production systems and diets in mountain areas. | % agricultural area in mountains under future smart crops and drought resistant crop varieties<br><br>Number of resilient livestock species promoted in mountain areas |
| | | Improved investment in infrastructure, research, technology and solutions for mountain food systems. | Length of roads (in km) built and improved to strengthen the access of mountain farmers to market and collection centers<br><br>Investment (in USD) made in food value addition related infrastructure in mountains<br><br>Quantity of agricultural loss to diseases |

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| *Attaining resilience against climate change related health impacts, promoting climate-resilient health services, and significantly reducing climate-related morbidity and mortality, particularly in the most vulnerable communities* | Mortality rate attributed to household and ambient air pollution<br><br>Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene<br><br>Human-wildlife conflicts (# incidences, disaggregated)<br><br>Productivity losses due to climate change impacts<br><br>Malaria incidence per 1,000 population [because weather and climate affect the spread of vector-borne disease] | Reduced mortality rates of mountain communities resulting from air and water pollution<br><br>Minimise human-wildlife interaction to prevent pandemics<br><br>Reduced health impacts related to cryosphere such as due to meltwater contamination | Change in water, air pollution and vector born related deaths in the mountains and downstream<br><br>Number of local governments practicing one health concept<br><br>Incidence of health issues related to cryosphere changes such as waterborne diseases due to meltwater from glaciers and permafrost thaw<br>Decrease in incidents of human wildlife interaction in and around mountain protected areas and corridors |
| *Reducing climate impacts on ecosystems and biodiversity and accelerating the use of ecosystem-based adaptation and nature-based solutions, including through their management, enhancement, restoration and conservation and the protection of terrestrial, inland water, mountain, marine and coastal ecosystems.* | Mountain Green Cover Index<br><br>Red List of Ecosystems<br><br>Red List of Species<br><br>Services Provided by Ecosystems<br>Policy and/or incentives for green infrastructure as nature-based solutions<br><br>Number of nature-based solutions for adaptation projects implemented<br><br>Proportion of land that is degraded over total land area. | At least 30% of the fragile cryosphere dependent ecosystems such as high-altitude rangeland and wetlands, mountain forest and riverine ecosystems are restored to enhance resilience. | Change in mountain green cover index<br><br>Change in mountain ecosystem productivity (rangeland, forests, agriculture) through mountain specific nature-based solutions/ecosystem-based adaptation and restoration<br>Changes in health of glacier-fed ecosystem<br><br>Change is population status of mountain endemic species<br><br>Increase in mountain protected areas and OECMs along with connectivity<br><br>Proportion of degraded mountain ecosystems restored |

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| | Protected areas and OECMs effectively managed in climate adaptation and resilience priority areas (%, ha, km) | | |
| *Increasing the resilience of infrastructure and human settlements to climate change impacts to ensure basic and continuous essential services for all, and minimizing climate-related impacts on infrastructure and human settlements* | Total official international support (official development assistance plus other official flows) to infrastructure<br><br>Proportion of municipal solid waste collected and managed in controlled facilities<br><br>Number of open spaces/streets with greening and shaded areas<br><br>Reduction in direct economic losses due to climate-related impacts (USD/year) (also covers aspects of livelihoods)<br><br>Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population<br><br>Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015–2030. | Increased investments to effectively manage waste, enhanced adaptive capacity, increase green open areas to build ecosystem resilience in the mountains<br><br>Enhanced infrastructure resilience to cryosphere-related hazards caused by glacier and permafrost changes | Multi-hazard risk zonation developed for mountain areas to identify safe and high-risk areas<br><br>Number of people moved to safe areas in mountain<br><br>Number of early warning systems instituted in prone and vulnerable mountain areas to multi-hazards<br><br>Decrease number of deaths from climate climate-related impacts on infrastructure and mountain settlements<br><br>Proportion of local governments in mountain areas that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies<br><br>Number of infrastructure projects in mountains incorporate cryosphere risk assessment<br><br>Reduction in infrastructure damage in mountains from cryosphere related hazards. |
| *Substantially reducing the adverse effects of climate* | Number of deaths, missing persons and directly affected | Human, economic and ecosystem losses are minimised | Change in number of GLOFs, avalanches, landslides, and flashfloods |

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| *change on poverty eradication and livelihoods, by promoting the use of adaptive social protection measures for all* | persons attributed to disasters per 100,000 population<br><br>Direct economic loss attributed to disasters in relation to global gross domestic product (GDP)<br><br>Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies<br><br>Connectivity measures or ecological networks to counter fragmentation<br><br>Habitat Restoration<br><br>Number of people covered with climate information and early warning systems | from climate change using mountain specific nature-based solutions and ecosystem-based adaptations.<br><br>Number of deaths, missing persons, and directly affected persons attributed to cryosphere and other-related disasters in mountains per 100,000 population<br><br>Direct economic loss attributed to cryosphere-related and other mountain disasters | Change in loss and damage value including human and economic losses<br>Number of mountain specific adaptation plans in place<br><br>Measure economic losses caused by glacier melting, permafrost thaw, and snowpack changes in mountain regions.<br><br>Number of early warning and disaster management plans in place<br><br>The proportion of degraded mountain ecosystems restored and connectivity between the protected areas and isolated habitats connected. |
| *Protecting cultural heritage from the impacts of climate-related risks by developing adaptive strategies for preserving cultural practices and heritage sites and by designing climate-resilient infrastructure, guided by traditional knowledge, Indigenous Peoples' knowledge and local knowledge systems.* | Total per capita expenditure on the preservation, protection and conservation of all cultural and natural heritage, by source of funding (public, private), type of heritage (cultural, natural) and level of government (national, regional, and local/municipal)<br><br>Percentage of the population in traditional occupation | The shared cultural and natural heritages of mountains preserved by promoting and strengthening traditional climate change adaptation practices | Number of culturally important sites and natural heritages in mountains promoted and and strengthened in their management effectiveness.<br><br>Number of preventive measures taken for preservation of traditional knowledge and practices contributing to cultural and natural heritages<br><br>Mountain heritage preservation policy in place and functional with positive results |

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| | Damages to or losses of ecosystems and infrastructure that are considered cultural heritage caused by climate-related hazards<br><br>Ecosystems relevant for cultural heritage protected from climate change impacts (%, ha)<br><br>Prevented loss in revenue (USD/year) due to preservation of cultural heritage that currently generates revenues from its use (e.g. tourism revenues) | | A strategy developed and implemented on sustainable and climate resilient tourism in culturally important sites in mountains |