

## **WMO HIGH MOUNTAIN SUMMIT**

**GENEVA, SWITZERLAND, 29-31 OCTOBER, 2019**

### **CALL FOR ACTION**

#### **AVOIDING THE IMPENDING CRISIS IN MOUNTAIN WEATHER, CLIMATE, SNOW, ICE AND WATER:**

#### **PATHWAYS TO A SUSTAINABLE GLOBAL FUTURE**

##### **RECALLING**

- (1) the 2030 Agenda for Sustainable Development that recognizes inter alia that economic and social development depends on the sustainable management of our planet's natural resources and confirms the determination of the international community to conserve and sustainably use oceans and seas and freshwater resources, as well as forests, mountains and drylands, and to protect biodiversity, ecosystems and wildlife,
- (2) the United Nations Framework Convention on Climate Change (UNFCCC), which recognizes that developing countries with fragile mountain ecosystems are among the countries that are particularly vulnerable to the impacts of climate change,
- (3) the United Nations General Assembly Resolution A/RES/71/234 on "Sustainable Mountain Development" and the findings of the IPCC Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC),

##### **NOTING**

- (1) that mountain regions cover about a quarter of the Earth's land surface, are centres of biological and cultural diversity and of traditional knowledge, that mountain ranges are often shared across countries, and that around 1.1 billion people, including indigenous peoples, live in mountain regions in all continents,
- (2) that high mountain areas include all mountain regions where glaciers, snow, or permafrost are prominent features of the landscape, and that river basins with headwaters in the mountains supply freshwater to over half of humanity, mountains being referred as "the water towers" of the world,

NOTING ALSO the importance of specifically addressing challenges in mountain regions for accomplishing many targets of the Sustainable Development Goals (SDG) of the 2030 Agenda, the Sendai Framework for Disaster Risk Reduction 2015-2030, and the UN Declaration on the Rights of Indigenous Peoples,

TAKING NOTE that integrated, actionable, and fit-for purpose multi-hazard early warning and predictive services specific to mountain threats are crucial components of climate change adaptation strategies (e.g. on glacier lake outburst floods (GLOFs), floods including flash floods, and debris flow, landslides, avalanches, orographic and extreme precipitation events, rain on snow, droughts, fires, foehn type storms, air pollution, etc.),

##### **CONCERNED that**

- (1) people living in mountains are among the world's most vulnerable and marginalized people, and that one in two rural mountain people in developing countries is vulnerable to food insecurity,

- (2) that pressures from amplification of anthropogenic-induced climate change are causing an unprecedented crisis in the high mountain earth system that threatens the sustainability of the planet, with alterations and loss of critical mountain ecosystems and the cryosphere, and jeopardizing mountains' capacities to support livelihoods, including on lowlands,
- (3) that water security is becoming one of the greatest challenges of the world, and that the uncertainty of the availability of freshwater from mountain rivers, in particular the cryosphere related water supply, is a significant factor of risk for local and downstream agriculture, forestry, food production, hydropower production, transportation, tourism, recreation, infrastructure, domestic water supply, and human health,
- (4) that the impacts of changes in mountain cryosphere on people and economies have not been well articulated in major international policy frameworks such as the Sendai Framework for Disaster Risk Reduction 2015-2030, the Paris Agreement on Climate Change, the UN Declaration on the Rights of Indigenous People, the UN Convention on biological diversity, and the UN Convention to combat desertification,

MINDFUL of the scarcity of meteorological, hydrological, climate, and cryosphere observations in mountain regions, the fragmentation of available data across many actors, the criticality of reliable data to support and inform policy and actions, coupled with the potential of space-based observing systems to provide observations of high spatial, spectral and temporal resolutions of the Earth's cryosphere, over high mountain areas,

REAFFIRMING the strategic objectives of the World Meteorological Organization (WMO) to produce meteorological, hydrological and climate information and services supporting actions on sustainable development, with a focus on resilience to climate change, assist in reducing losses of life and property from hydrometeorological hazards, and enhance the socioeconomic value of hydrometeorological services, and the High Mountain Challenges endorsed by 18th World Meteorological Congress (Cg-18),

REAFFIRMING ALSO the role of the Mountain Partnership as the UN multi-stakeholder platform for promoting sustainable mountain development, knowledge sharing, and advocacy dialogue,

UNDERSCORING that meteorological and hydrological forecast and prediction products and climate outlooks and scenarios that are produced by WMO Members are produced based on the global infrastructure of the integrated global observing systems, the information system, and the Global Data-processing and Forecasting System (GDPFS). The latter includes World Meteorological Centres (WMCs), Regional Specialized Meteorological Centres (RSMCs), and National Meteorological and Hydrological Centres, as well as Global Producing Centres for Long-Range Forecasts (GPCLRFs), Regional Climate Centres (RCCs), and Global Producing Centres for Annual to Decadal Prediction (GPCs ADPC);

#### CALL FOR ACTION:

**We**, the participants at the High Mountain Summit 2019 following engaging presentations and inter- and trans-disciplinary dialogues, **hereby commit to the goal that people who live in mountains and those who live downstream, have open access to, and use 'fit for purpose' (tailored) hydrological, meteorological, and climate information services** that address their needs to adapt to and manage the threats caused by unprecedented anthropogenic-induced climate change, recognizing the importance of mountain regions as home of the cryosphere and source of global freshwater.

To meet this goal, **we commit with priority to an Integrated High Mountain Observation, Prediction and Services Initiative with user-centered goals**, building on existing knowledge and activities, with international coordination and multidisciplinary approaches, organized as collective, intensive campaigns of analysis and forecasting demonstration projects in key mountain ranges and headwaters around the world, and with transboundary scale foci. This initiative will enable to co-design solutions, build capacity, and support and facilitate investments, by actively engaging information users, providers, and producers to address the front lines of climate, cryospheric, and hydrological change in support of natural hazard risk management and adaptation in mountain regions and downstream.

We urge Governments,

- **to review and update their international development cooperation policies**, and, as applicable, together with intergovernmental organizations and donor agencies, and **make “sustainable mountain development and mountain ecosystem conservation” an integral part of them**, to ensure that mountains remain the water towers of the world, including by strengthening transboundary cooperation in open data sharing, forecasting and prediction research and services, policy development, as well as knowledge generation, mobilization, communication, and dissemination;
- **to declare a UN International Year of Mountains (IYM)**, as a mechanism for the international community to carry-out the actions of this Call, and with links to the proposed International Year of Snow and Ice discussed at the intergovernmental council of UNESCO IHP (2018) and the WMO Executive Council (EC-70, 2018);
- **to explore an integrated global UN mountain framework** for coordinating evidence-backed measures for mountain environments across all thematic domains, such as food, health, climate change, disaster reduction, biodiversity loss, water management, social and economic development;
- **to allocate adequate financial and human resources for long-term and sustainable operation and maintenance** of the relevant infrastructure needed for providing user-tailored services, addressing changes in mountain cryosphere and environments.

Furthermore, we call upon international, regional, and national institutions along the information value chain, including scientific and research networks, academia, policy-makers, the civil society, funding agencies, the private sector, to support adaptation actions, and

- **to recognize the role of mountain areas and the importance of mountain specific non-economic** (cultural, intrinsic, spiritual) **and economic activities** (e.g. energy production, tourism, agriculture, and forestry, etc.), the weight that these activities have especially in those countries that are integrated into mountainous areas and those critically dependent on the evolution of snow cover, glaciers, permafrost, etc. and to recognize that the negative evolution of these, due to climate change, will have devastating effects on their societies,
- **to actively promote the increase of awareness of the impacts of climate change on high mountains** and how these affect mountain and downstream populations, in support of adaptation plans to reduce the escalating risks, irrespective of the climate scenario;
- **to strengthen global and regional collaboration in the mountain space** by actively engaging at different levels, including within the Mountain Partnership framework for action on implementing the 2030 Agenda for mountains, to enhance the sharing of information and best practices;

- **to iteratively reinforce linkages** between policy and scientific research findings, the traditional and indigenous knowledge, and the diversity of societal needs and vulnerabilities of various social groups living in mountain and downstream environments, in the co-production of knowledge, by making better use of existing knowledge, and making the sustainability of adequate local scientific and technical capacities, a pivotal component of any such strategies;
- **to advocate for stakeholder-based and user-centered integrated risk management systems**, spanning different administrative levels and sectors, to enable optimal governance decisions to sustain mountain social-ecological systems as a global asset, and address crucial communication gaps such as differences in risk perception that fosters or slows down adaptation activities;
- **to promote the inclusion of mountain-specific indicators in local, national, regional and global reporting mechanisms and review processes and commitments**, inter alia, the National Adaptation Programmes of Action (NAPA) and Nationally Determined Contributions (NDCs) under UNFCCC, Voluntary National Reviews (VNRs) on SDGs, the national reviews of the Sendai Framework for Disaster Risk Reduction 2015-2030, the National Biodiversity Strategies and Action Plans (NBSAP) process of the Convention on biological diversity, etc. Also, to promote the inclusion of mountain-relevant indicators in periodical review processes of agencies in the UN system (e.g. WMO, FAO, UNESCO, UN Environment, and others) and in the scientific knowledge synthesis and assessments that are supported by relevant global research communities and networks (e.g. International Science Council, GEWEX, MRI, GWF, etc.);
- **to build stronger communication, networking, cooperation, and partnerships among meteorological, climatological, hydrological, and cryosphere monitoring and scientific research institutions**, including the National Meteorological and Hydrological Services (NMHSs), climate change research institutions, academia, and other relevant actors, with the goal of developing comprehensive and integrated weather, climate and hydrological services tailored to mountain specific threats and needs, including through leveraging the influence of users of these services;
- **to establish, with a long term perspective, national and regional frameworks for climate services** to coordinate institutions, partners, and users and enabling them to co-design, co-produce, communicate, deliver and use climate services for decision-making, addressing the upstream-downstream impacts of changes in mountain environments,
- **to advocate for addressing the underfunded development of climate services in mountain regions** by substantially scaling up public and private investments in mountain-specific sustained services and by enhancing the facilitation of and access to funding mechanisms, with a focus on enabling scalable pilot actions with the overarching goal of building resilient societies;
- **to address critical gaps in mountain earth system observations** in order to support integrated predictions and services, pursuing with priority the strengthening of remote sensing observations of the mountain cryosphere, and **the development of intra- and inter-operability of data platforms of operational and research programs and projects**, upon which services are built;
- **to advocate for open and free access to and exchange of meteorological, hydrological, climate, and cryosphere data** from all programmes and projects in mountain regions.
- **to foster cooperation and capacity building** on data processing and management methodologies for consistent, disaggregated, timely and quality data in a sustainable manner.

- **to foster and support specific education initiatives** at all levels, curriculum-based programs at secondary and university level, and networks among educational institutions, with the goal of preparing early career professionals – to meet the needs of users, stakeholders, and policymakers in mountainous regions facing evolving challenges, and foster broad climate literacy.

### **PROPOSED ROADMAP:**

To pursue these goals, we commit to the following actions:

- form an initiative to pursue an Integrated High Mountain Observation, Prediction, and Services Project building on existing relevant initiatives, fostering exchanges and interactions between people, users, science, services, and input to policymakers, organized around key mountain ranges and headwaters of the world, in support of natural hazard risk management and adaptation in mountain regions and as transmitted downstream by rivers to large segments of the Earth's human population and ecosystems. Urge WMO Research Board in coordination with the Global Cryosphere Watch to take a leading role on coordinating across WMO sponsored and co-sponsored research programmes;
- pursue a consortium of national and international institutions and networks representing policy, practice, scientific research, academia and funding agencies, to support the proposed Integrated High Mountain Observation, Prediction and Services Project, and to organize coordinated observations and predictions campaigns within the scope of a Year of Mountain Prediction (YMP), potentially in conjunction with the UN International Year of Mountains;
- expand the scope of the WMO Global Data Processing and Forecasting System to include Mountain Specialized Centres. Initiate a pilot on High Mountains Analysis and Forecasting Demonstration Project, towards a Mountain Earth System Forecasting and Prediction System as called by 18<sup>th</sup> World Meteorological Congress (Cg-18) for adaptation, resilience, reducing & managing increasing climate risks, by building on the WMO cascading prediction architecture and on the experience of the Severe Weather Forecasting Demonstration Projects. Within the framework of WMO, high mountain regions could be an effective test bed for developing new techniques, as the regions are complex, while limited, geographically;
- accelerate and enhance the development of existing WMO programmes to include mountain-focused components, to support national hydrological and meteorological services and other institutions to develop climate, cryospheric, and hydrological information and prediction products and services for decision-support in water management in climate-sensitive mountain river basins, such as the World Hydrological Cycle Observing System (WHYCOS) with its regional components, WMO Global Hydrological Status and Outlook System (HydroSOS), the Global Cryosphere Watch in conjunction with the Polar Space Task Group, and Regional Climate Centres;
- pursue the development of a framework for an integrated global cryosphere data and information system to foster sustainable access to cryospheric data, information, and products, through standardization following the FAIR guiding principles, and develop and/or strengthen existing knowledge hubs such as HKH Cryo-hub for sharing of data and information. As a first step focus on the discoverability of existing observations through the Observing Systems Capability Analysis and Review Tool (OSCAR) of WMO;

- foster collaboration with and amongst space agencies with a focus on a coordinated approach to enhancing the monitoring of cryosphere in high mountain areas, supporting relevant applications and services, within engagements of the Coordination Group for Meteorological Satellites (CGMS) and the Committee on Earth Observation Satellites (CEOS).
- build on existing mechanisms such as the Alpine and the Carpathian Conventions, the Andean Mountain Initiative, the Africa Mountain Partnership Champions Committee and anchor these in the relevant institutional frameworks such as the East African Community, the High Andean Wetlands Regional Initiative, the Interstate Commission on Sustainable Development of Central Asia and the Hindu Kush Himalaya Call to Action.