Policy Brief #1

（Meteorological Observation and Upper Atmospheric Climate Data Share）

Preamble

The ISC GeoUnions Standing for DRR seeks to strengthen the long-standing International Science Council (ISC) leadership in advancing Disaster Risk Reduction. The International Council of Scientific Unions (the predecessor to ISC) coordinated and represented the science and technology communities in preparation to the 3rd World Conference on Disaster Risk Reduction that reported the Sendai Framework for Disaster Risk Reduction. The ISC and the UN Office on Disaster Risk Reduction co-sponsor the Sendai Hazard Definition and Classification Review to further define the Sendai Framework to provide consistent awareness and terminology to strengthen and clarify actions in support of the Sendai Framework and improved societal well-being.

Context

WMO Data Conference observed that despite huge technological progress, there are still big gaps in observations which underpin all weather forecasts and climate predictions. It is said that with better data, one can do (better) informed decisions, informed actions on risk and better disaster management and sustainable development. In recent years, these meteorological stations are not properly maintained and managed, so we are experiencing missing data for few days, months, and years from such stations particularly in Developing Countries. Filling the gaps in Global data coverage is urgent need of the hour.

Impacts

Such issues pose more problematic situation in mountain regions which are known as ungagged basis. The recent flood furies in India at Leh (2010), Uttarakhand (2013) and Jammu and Kashmir (2014) have shown the significant vulnerability of the mountains like Himalaya. The nature and mechanism of all the three events were different due to varying geographical factors but all three caused by extreme rainfall. Both the Leh and Kedarnath floods were induced by cloud burst, but the spatial impact varied. The impact varies

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between flat land topography and high hill region. Leh being a flat land the impact was confined to local areas only but in the case of Kedarnath, due to ridge and valley topography, the impact was carried to the downstream area that caused massive devastation. The number of occurrences and the trend of these cloud burst event have been continuously increasing. In 1908 one cloud burst was reported. After a span of 62 years, another cloudburst occurred in July 1970 at Uttarakhand. Since the 1990s, 17 cloudbursts have caused massive damage to live and properties of which at least 11 cloudbursts occurred only in the three hilly states of Uttarakhand, Himachal Pradesh and Jammu and Kashmir. Now, this phenomenon seems to be highly frequent: 11 out of the 17 cloud bursts occurred only during 2010-2013. One can say that the increase in the frequency of such incidences is because of frequent changing weather and climate with low probability and high impact in many parts of the world. We do not have free accessible, adequate spatial coverage and long-term continuous data from mountain observatories, station networks and experimental basis for hydrological forecast and prediction. Exchange of surface-based observations has also been stagnant for hydrological observations since 1995. These gaps are more prominent in Africa, S. America, and Asia. In lack of such data, a study of hazards and risks cannot be focused on wider spatial coverage which constitute regions with specific hazards and risk potentials. On the other hand, model resolutions have increased by factors of 1000-10,000! (WMO, 2020).

Policy Advise to National Governments

1. The Governments should allocate substantial resources to increase spatial distribution of surface meteorological stations and improve networking in the region where gap exists.

2. The Governments should properly maintain existing stations in order to get continuous temporal data for satisfying trans disciplinary needs for an integrative study of hazards, risks and vulnerability.

3. The Governments should invest in deploying huge advances of Science and Technology such as automatic weather stations to deal with lack of data in gap regions.

4. The Governments should involve private sector for supplementing these facilities.

5. The Governments should ensure adequate utilisation of commercial flights for upper atmospheric measurements, which will enhance our understanding about climate change monitoring, avalanches prediction, cloud burst and extreme floods.

6. The Governments should ensure communities and local governments be involved as participatory monitoring for data gathering, storage and dissemination for Earth

and weather observation data, to enable appropriate decisions for the benefit of human being.

7. The Governments should support legislation in favour of integration of data from surface based in situ observations, earth observation satellites; geographical information and numerical weather prediction model outputs, which will allow to mitigate climate change and hydrological problems and ensure greater socio-economic benefits.

8. The Governments should invest in qualified professionals and intelligent software to process, integrate, and analyse data, and prepare simulations and predictions to support decision making

9. The Government should invest in educating students, professionals, and citizens about the effects of climate change and global warming to increase the capacity of communities and local governments to improve the understanding and support mitigating effects of climate change for global sustainability.

Action Advise to ISC GeoUnions members and expert panels.

GeoUnion Members are asked to support this policy briefs by distributing to respecting expert panel groups and disseminate to Governments and NGOs.

Involvement of Global Stakeholders to Disseminate This Policy Brief

International Science Council, IAP Global Network of Science Academies, WMO, National Meteorological Agencies, Geo-Unions be involved for dissemination of.

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