

Weather and Climate Data Requirements and Capacity for Disaster Risk Financing and Insurance Solutions

Joint InsuResilience and CREWS Secretariats' Discussion Note

Background and Intention of the Paper

1. Following discussions at the CREWS Steering Committee's Fifth Meeting, this joint paper by the Secretariats of InsuResilience and CREWS aims to identify opportunities for collaboration between the two initiatives to improve weather and climate data for disaster risk finance and insurance, as well as to strengthen early warning systems.
2. To identify the scope for these areas of collaboration, the two Secretariats carried out initial consultations with a number of partners and experts¹.
3. Those consulted noted there would be added value in further strengthening the collaboration and developing a joint workstream to address weather and climate data and related institutional capacity requirements for insurance and disaster risk finance requirements in Least Developed Countries (LDCs) and small island developing States (SIDS).
4. The InsuResilience and CREWS initiatives both contribute to climate change adaptation and disaster risk reduction, and more specifically to protecting lives and livelihoods. Both initiatives work at complementary ends of a risk reduction value chain—preventive action and addressing the residual risk—and both rely on the availability of solid data.
5. The InsuResilience Global Partnership for Climate and Disaster Risk Finance and Insurance Solutions was launched at the 2017 UN Climate Conference in Bonn. It aims to strengthen the resilience of developing countries and protect the lives and livelihoods of poor and vulnerable people against the impacts of disasters. The objective is to enable more timely and reliable post-disaster response and to better prepare for climate and disaster risk through the use of climate and disaster risk finance and insurance solutions, reducing humanitarian impacts, helping poor and vulnerable people recover more quickly, increasing local adaptive capacity and strengthening local resilience.
6. The Climate Risk and Early Warning Systems (CREWS) initiative provides financing to LDCs and SIDS to significantly increase the capacity to generate and communicate effective, impact-based, multi-hazard, gender-informed early warnings and risk information to protect lives and livelihoods.

¹ German Federal Ministry for Economic Cooperation and Development (BMZ), the United Kingdom Department for International Development (DFID), UK MetOffice, the World Bank and the Global Facility for Disaster Reduction and Recovery (GFDRR), the International Federation of the Red Cross/Red Crescent Societies (IFRC), German Red Cross, the Caribbean Catastrophe Risk Insurance Facility (CCRIF), WillisRe and the Pacific Catastrophe Risk Insurance Company.

Data and capacity of national institutions – a joint challenge of InsuResilience and CREWS

7. Setting up a parametric/index insurance product requires weather and climate data such as air temperature, rainfall, wind speed, and river flow.ⁱ Historical climatological records—at a minimum for a 10-year period—including extreme events, are required to create the index and pricing or to inform catastrophe risk models that are needed to evaluate the risk.ⁱⁱ Similar data is required to set thresholds for weekly, monthly and seasonal forecasts to trigger preparedness action supported by forecast-based finance schemesⁱⁱⁱ (See Figure 1).

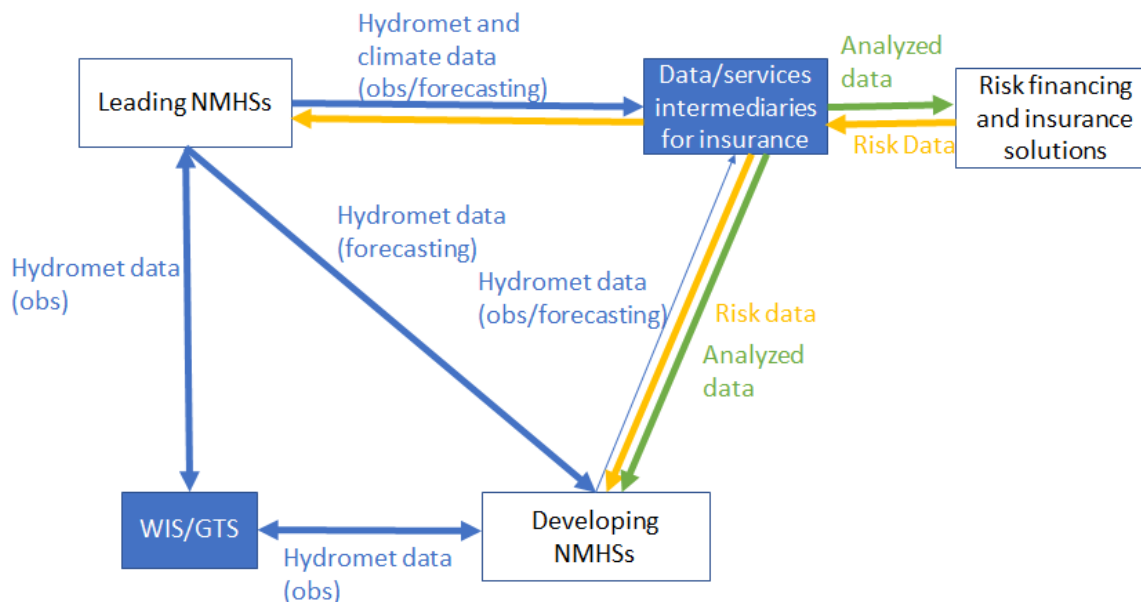


Fig. 1: Schematic of weather and climate data for risk financing and insurance solutions

8. However, this data is not readily available or not available with sufficient reliability or coverage in LDCs and SIDS. Therefore, it is currently challenging to set up index insurance in those countries. Moreover, without data, risk assessments are not possible and risk sharing measures cannot be implemented efficiently.
9. National Meteorological and Hydrological Services (NMHS) and other World Meteorological Organization (WMO) regional and global entities undertake climate monitoring, data collection, analysis and forecasting and climate projection activity. Global and regional datasets from reanalysis centers, climate and impact models and satellite agencies from this network are significant sources of data. After the appropriate data has been identified and obtained, there is a need to analyze the data in order to be able to interpret it and draw conclusions.^{iv}
10. The work carried out through CREWS with WMO and the World Bank, in data rescue and strengthened ground-based observing systems in countries with limited capacity in this area, could strengthen the historical and continuously updated climate and weather data required for

designing and implementing index insurance schemes and accelerate the penetration of risk sharing schemes in these counties.^v

11. Although ground-based data is acknowledged to be the most reliable data, its unavailability has led to the development of other techniques to obtain weather data, such as radar and satellite. These techniques nevertheless require validation through ground data.
12. Many countries have gaps in their data records, historic weather data is often not digitalized and paper records are in bad condition. Some countries have inadequate coverage of rain gauges but even where rain gauge stations cover the territory, weather stations might only send information once a month or the stations may not be at all connected. Lack of training often impedes proper maintenance and calibration of observation equipment or integration of data into standard data processes.^{vi}
13. In the LDCs and SIDS where CREWS invests, not only is data incomplete or inadequately detailed, it is often inaccessible for risk insurance even when it does exist. NMHSs have been encouraged by their governments to establish cost-recovery mechanisms to improve the financial sustainability of their services, as historical records are valuable and can be provided at cost in some contexts. Greater efforts are required to involve national meteorological service and other relevant national authorities to promote this data access and sustainability.
14. Due to the rapid development of technologies, private sector today has the capacity to provide far more hydrometeorological observations and weather services than in the past. This is happening in parallel with the public-sector funding being under pressure while demands for national hydrometeorological services are growing. Opportunities for linkages exist with the private sector through initiatives that bring together the public, private sectors and academia, such as the Global Weather Enterprise (GWE).

Opportunities for CREWS Investments to Strengthen Data Availability and Accessibility for Insurance and Disaster Risk Finance

15. When data is not available or accessible, insurance companies procure their own through private investments, which represents a missed opportunity for the NMHS and a benefits loss to the public. Conversely, investing in the strengthening of NMHSs' ability to provide relevant data for insurance and disaster risk finance would be beneficial to all parties.
16. Projects supported by CREWS and InsuResilience could take the following actions to simultaneously contribute to the development of data for insurance and risk finance, as well as early warning systems:
 - In the design and expansion of hydrometeorological observing systems projects, the data needs for parametric insurance and risk finance could be considered, as well as early warning systems.

- When developing risk information and analyzing data projects could ensure the seamless use of such information for early warning services, insurance and risk finance to optimize the use of resources. For example, the Flood Risk Assessment Platform developed for Southeast Asia Disaster Risk Insurance Facility (SEADRIF) can potentially contribute to the improvement of flood early warning systems for SEADRIF participating countries as well, while infusion of improved ground observation to the platform, which currently mostly relies on satellite remote sensing and global model outputs, can improve the information products developed on the platform.
- Systematic characterization and cataloguing of extreme weather, water and climate events in a form that allows data on disaster losses to be cross-referenced to the phenomena contributes to the improvement of impact-based warning and the design of insurance products. The work has been spearheaded by the WMO Inter-Programme Task Team on Cataloguing Extreme Weather, Water and Climate Events (IPTT-CWWCE).

Possible Collaboration between CREWS and InsuResilience – setting up a joint workstream

17. The collaboration will enable the leveraging of synergies between the two initiatives. CREWS could develop data sets geared towards better climate adaptation management, e.g. feeding into risk transfer solutions. The InsuResilience Global Partnership's risk solutions would benefit from better risk models fed by more granular and reliable data sets. This serves the purpose of more comprehensive disaster risk management for the respective countries. Given the similar data needs required for early warning as well as insurance and disaster risk finance, CREWS and InsuResilience could collaborate on a workstream to assess in detail:

- Data requirements and availability
- Institutional capacities
- Modalities and business models for the provision of data
- Scale of the investment needed to meet requirements.

18. A first study under this workstream would analyze the weather and climate data needs, availability, accessibility and reliability in a selection of countries in which both InsuResilience and CREWS have investments in the context of the requirements to facilitate the penetration of risk financing and insurance solutions.

19. The study would look at (i) weather and climate data needs for various risk financing and insurance schemes such as risk modeling, risk pricing and parametric payouts; (ii) data availability from observation, monitoring, collection, analysis and forecasting, and (iii) capacity, accessibility and reliability issues.

20. The end product would provide:

- an estimation of the investment requirements and feasibility to provide basic requirements for weather and climate data in a number of LDCs and SIDS to accelerate access to risk financing and insurance solutions.
- a methodology and body of expertise to review climate and weather data availability, accessibility and reliability for risk financing and insurance solutions.

Next steps

- **June 2018** - present the scope of the workstream “Weather and Climate Data Requirements and Capacity for Disaster Risk Financing and Insurance Solutions” to the CREWS Steering Committee.
- **July - October 2018** – expert consultations seeking alignment, as appropriate with existing working mechanisms of the InsuResilience initiative and WMO.
- **November 2018** – final concept presented at COP24 for the workstream with an initial checklist and terms of reference for the country studies.
- **First quarter 2019** –country studies begin.
- **Third quarter 2019** – first draft of the study is available for consultation.
- **November 2019** - final study is available at UNFCCC COP25.

ⁱ Spicka, Jindrich and Jiri Hnilica, “A Methodical Approach to Design and Valuation of Weather Derivatives in Agriculture”, Hindawi Publishing Corporation, *Advances in Meteorology*, vol. 2013, 8 pages.

ⁱⁱ Young, Simon. “Weather data requirements of the insurance market and availability in SSA” in *Insurance Instruments for Africa Climate Adaptation—First Phase; Draft final report*. Unpublished.

ⁱⁱⁱ German Red Cross and the Red Cross Red Crescent Climate Centre, “Feasibility Study for Forecast-based Financing Interventions” in *Manual for Forecast-based Financing*. Available: <http://fbf.drk.de/manual.html#>

^{iv} WMO Concept Note: Enhancing the Climate Rational in all GCF Funded Activities. 2018. Unpublished.

^v CREWS Report of the Fifth Meeting of the Steering Committee. 2017. CREWS. Unpublished.

^{vi} Young, Simon. *As above*.