Systematic Observations Financing Facility
Third Potential Funders’ Forum

Agenda item 2
Rationale for SOFF and call for action

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Rationale for SOFF
Weather and climate know no boundaries

• Lack of observations limits ability to monitor, understand and predict weather and climate, both locally and globally;

• Weather prediction beyond 3-4 days for any location on the globe requires exchange of observations world-wide.

• Even at detailed local scales, climate reanalysis and climate prediction both depend on global models, fed with local observations.

• Lack of observations will initially lead to poor quality of model data locally; over time this will spread globally.

Example: Lack of observations in red area limits 7-10 day forecast skill in green area; weather/climate knowledge in red area poor!

Example: Required areal coverage of observational data for weather prediction over the United States for different ranges
The meteorological value chain

Weather and climate-related infrastructure - must be designed and managed globally

Last-mile activities undertaken primarily at regional, national and local level

Observations from the entire globe
International exchange of observations
Global Numerical Weather Prediction

Effective decision-making and action
Delivery of weather and climate services
Local data processing, forecast, warning and advisory products
Current state of international exchange of observations and why this is a problem - local and global implications

In many areas the exchange of surface-based observations has been stagnant or declining since 1995; red/black areas do not meet data requirements.

Meanwhile model resolutions have increased by factors of 1,000-10,000 since 1995!

Areas not in green, in particular areas in red or black indicate lost opportunities for generating high quality weather and climate data products; quality of local weather and climate products will be especially poor in areas with red or black stations.

Surface pressure observations received by global NWP Centers on Sept 9 2021)
(source: WIGOS Data Quality Monitoring System)
WMO response to persistent data gap

Global Basic Observing Network (GBON)*

GBON: Network based on a global design agreed between all WMO Members, to turn data coverage map green;

- Regulations specifying obligation of countries to acquire and exchange certain observations at set minimum horizontal resolution and at set minimum frequency;
- Once approved, GBON regulations can be implemented immediately in many parts of the world

Economic benefits of full GBON implementation in countries with largest data coverage gaps estimated to exceed USD 5 billion per year, due to improvements in weather prediction alone (climate-related benefits not yet assessed)

* WMO Congress October 2021, draft Res. 5.2/1
WMO Convention and Paris Agreement implicitly assume that observations is solely a national responsibility

**Ability to observe (left panel):** Observing systems in countries depicted in red fail to meet minimum observations requirements for weather and climate analysis and prediction

**Ability to pay (right panel):** Affordability of observing responsibility (GDP/km2 of surface area) of countries in yellow up to ten million times higher than for countries in dark blue

Figure 2: This map shows the horizontal resolution of surface observations in different countries based on stations actively reporting in January 2020. Source: WMO Secretariat.
The cause of missing observations in SIDS and LDCs

• Lack of a **globally coordinated approach** matching the global nature of the problem
• Lack of a clearly defined, appropriate **measure of success**
• Lack of a **long-term and systematic approach** to strengthen capacity
• Lack of a **coordinated and integrated** implementation approach
• Lack of a **realistic financing** model
Call for action
Global call for action

- SDGs
- Paris Agreement
- Sendai Framework
- UNFCCC - SBSTA

- Environmental *monitoring* and stewardship
- Strengthening scientific knowledge and capacity on *systematic observation of the climate system*
- Promoting the collection, analysis, management and use of relevant *Earth and climate observations*
- Sustained funding to meet the essential needs for global climate observation
Response to global call for systematic observation

• **Global Basic Observing Network (GBON)** - 193 states and territories committed to generation and international exchange of surface-based observations

• **Alliance for Hydromet Development** – 13 major climate and development finance organizations committed to the creation of SOFF

• **Beneficiary countries and global leaders** - call for the creation of SOFF
SOFF value proposition

Global approach and data exchange as measure of success

- Optimal, detailed and agreed global design and metrics — GBON

Innovative finance

- Results-based, long-term finance, incl. operations and maintenance
- Grants-only, recognizing a global public good

Technical competency and coordination

- Peer-to-peer technical assistance by advanced met offices
- Standardized, authoritative technical advice

Knowledge and resources leverage

- SOFF interventions underpinning last mile investments